THE MEDICAL NEWS.

A WEEKLY JOURNAL OF MEDICAL SCIENCE.

VOL. 84. NEW YORK, SATURDAY, MAY 7, 1904. NO. 19.

SPECIAL ARTICLE.

BELLEVUE HOSPITAL—THE OLD AND THE NEW.*

THE history of Bellevue Hospital goes back to an epidemic of yellow fever which occurred in New York in 1794. To us of this generation it seems almost impossible to conceive of yellow fever raging virulently as far north as New York, but it must not be forgotten that at the end of the eighteenth and the beginning of the nineteenth centuries epidemics of yellow fever were very frequent along the Atlantic coast, even as far north as Boston. At one time it was actually declared, by a committee of authoritative medical men who investigated the situation, that Philadelphia would have to be abandoned eventually as a site for a great city because of the frequency with which this disease ravaged the population. Its appearance was always followed by the yellow fever scare and in 1794 the fears of the inhabitants of New York, and especially the conviction that the disease would surely recur again the next summer because that was always the rule in the epidemiology of those times prompted the authorities to do something in order to lessen the danger of the spread of the disease. Dr. Carlisle, in his account of Bellevue Hospital, published by the Society of the Alumni of Bellevue Hospital, New York, 1893, gives the origin of the name Bellevue and the conditions of its original purchase as follows:

"It was the beginning of the worst yellow-fever period the city had experienced. The State government had represented to the city authorities the necessity of providing some place of isolation for persons afflicted with the malignant fever. The most eligible place that presented itself was that belonging to Mr. Brockholst Livingston, and situated on the East River, 'opposite the three-mile stone.' It was then held under lease from Mr. Livingston by Nicholas Devise. This lease was to run for six years, with the privilege of purchase for £2,000. In view, therefore of the exposed condition of the city, and in order to allay the fears of the citizens, it was determined to purchase this lease. Mr. Robert Lenox, in behalf of the board, concluded the purchase in 1794. This plot was about five acres in extent, and had been once a part of the Kip's Bay Farm. It was conveyed by Jacobus Kip about the year 1765 to Peter Keteltas; by him to Martin Hoffman, and by him in turn to Robert Leake, in 1772. Leake gave to the place the name of Belle View. In 1781 it was again sold, and in 1783 it came into the possession of Lindley Murray. The latter gentleman, while residing in England in 1793, whither he had retired at the close of the War of Independence, conveyed this property through his attorneys to Mr. Brockholst Livingston, who retained the name but with a different spelling,—Belle Vue,—and this is the genealogy of the name."

The principal building existing at that time on the plot thus secured was a two story and attic structure. This was not ready for occupation until the fall of 1794. Always with the first frost yellow fever declines and then promptly disappears, so that there was not much use for the newly acquired property during this first year. As anticipated, however, the fever occurred very early the next year and before the end of May some sailors had been transferred to Belle Vue (spelled as two words, in those times, the second one with a capital), by the health officer of the board. Some idea of the awful way in which the disease raged during this summer may be gathered from the fact that the deaths from yellow fever numbered 732, out of a population of less than 30,000. Hospital accommodations were incomplete, as is very likely to be the case in a rapidly growing town subject to all the dangers of an introduction of infectious diseases by the arrivals of vessels of all kinds, and so there came the first accounts of complaints with regard to Bellevue, which, as good New Yorkers we are sorry to say, have practically continued with certain noteworthy intervals of interruption ever since.

The next year the yellow fever did not come so early. Dissatisfaction with the mortality records of Bellevue and the hope that a more airy location and one farther removed from the city itself might prevent the spread of infection, led to the selection of Bedloe's Island as a place for the erection of a new pest house, and this was used as a quarantine station. The beds and bedding which had been used the year before at Bellevue were taken to this hospital, which was under the control of the State. The health officer of the time, Dr. Richard Bailey, complained in a report to Governor Jay that these articles were in a very filthy state, and that within eight days after they were brought from Bellevue those who had transported them, together with the nurse and the stewards of the house, were attacked with fever, the attending physician, Monsieur Bouvier, also being indisposed for several days.

Bellevue became a hospital again in 1798, as a result of the worst epidemic of yellow fever the city ever knew. There were over 2,000 deaths during the summer and fall of 1798 out of a population of about 60,000. In his account of Bellevue Hospital, Dr. Carlisle gives, on contemporary authority, the report namely of Dr. I. S. Douglass to John Oothout, Esq., Chairman of the Commit-

*We are indebted to the Society of the Alumni of Bellevue Hospital, through the courtesy of Dr. Robert J. Carlisle, for a number of the illustrations embellishing this article.

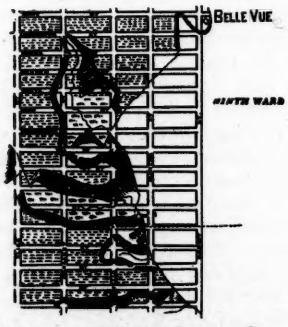
tee, as published in the *Medical Repository*, December 17, 1798, the details of this matter:

View from the Southwest about 1845.

"Belle Vue was opened on June 12, 1798, under the care of Dr. Isaac S. Douglass. From that date to November 14, 389 patients were admitted, perhaps three-quarters of whom were sick with pestilential fevers. There were sixteen nurses employed. Dr. Douglass himself contracted the disease, but he traced the infection in his case to his having visited friends in New York and having slept in a highly infected part of the city. Three days after his return to Belle Vue he was seized with a fever. He ultimately recovered, and in December of that year he was asked by the Health Commissioners to trace the source of infection in his own case. In his reply he gives some interesting facts in regard to the interior arrangements of the hospital: 'The health office boatmen who were in the habit of bringing the sick to Belle Vue from the city and shipping were accustomed to enter the hospital at all times, and to assist in placing as well as moving the sick from room to room. The number of the washerwomen during this period was seven. Several persons were employed constantly in cooking, cleaning, and in burying the dead. There were besides transient people, near relatives of the sick, who were permitted by the Commissioners to visit occasionally. Several persons accompanied their friends to Belle Vue, stayed with them and nursed them during their illness. Under all these circumstances there happened to my knowledge no instance of infection, although an opinion has been adopted by many that my sickness, whilst residing at Belle Vue Hospital, arose from infection imbibed at that place. . . . In making this declaration, I must remark to you that the situation of the medical attendants at Belle Vue was by no means a propitious one. Before the new buildings were erected for the accommodation of the sick, the physicians' room (the only one they had) was literally surrounded by them (the sick). The room adjoining the front and back piazzas, the hall, the rooms and hall in the second story, a room in the cellar that had been used for a kitchen, all contained sick. They were likewise placed in several Chinese summer-houses in the small space between the main house and the East River; and in the building erected for the purpose of a bathing-house. A large canvas was also erected (for want of a more convenient place) under the windows of the southwest part of the house for the reception of the dying and the dead. Under all the disadvantages enumerated, I know of no instance where infection resulted.'"

It is curiously interesting to find this anticipation of modern knowledge with regard to the non-infectiousness of yellow fever by ordinary contact, but if observations had been carefully made such would have been found to be the case by others. It is interesting but not very encouraging to find also that Bellevue Hospital at that time furnished opportunities for the study of infections of various kinds, extending even to the possibilities of physicians becoming infected because of the crowded way in which patients were housed and the cramped and narrow quarters allowed to overworked medical men. We might consider it due to the crudeness of the times and the one thing that one might be sure would not occur in a modern New York hospital would be just this overcrowding and its results, and yet this is the worst source of complaint with regard to the hospital at the present time.

The city realized the necessity for having the property as its own instead of renting it and so in 1798 it was bought for £1,800 sterling. For several years after its purchase there is no account of the reception of patients at Bellevue, but in 1803, as the result of another yellow fever outbreak, during which 700 deaths occurred in the city, nearly 200 patients were received into the hospital. Very few of these were natives or residents of New York, most of them being recent arrivals, immigrants principally from Ireland and Germany. The condition of affairs at the hospital can be best realized from the mortality statistics, the number of deaths during the summer and fall just equaled the number of recoveries. In 1805 Bellevue was handed over to the Health Department and was used for the last outbreak of yellow fever which occurred for some fourteen years. Notwithstanding these awful epidemics of fatal disease, the city continued to



Vicinity of Belle Vue in 1803.

grow, and in 1805 had over 75,000 and in 1810 had reached nearly 100,000 in population.

In 1811 it was considered necessary to secure a large site for the almshouse and hospital purposes and as a large plot of ground just next to

the house that had been used as a fever hospital at Bellevue could be obtained it was purchased. The property thus secured by the city is the present site of Bellevue Hospital and was bought from the heirs of the Kip family, having formerly constituted a part of the old Kip's Bay Farm. The committee which was sent by the Common Council to negotiate for the property was empowered to purchase the site at a price not exceeding $3,500 an acre. It was on this basis that the sale was made, the survey made by the city surveyor showing that the plot contained slightly over six acres. The liberal foresight displayed by the city authorities at the time was undoubtedly due to a large extent to the broad-minded sense of municipal obligations toward its citizens existing in the mind of the Mayor De Witt Clinton, and his action in this special matter seems to have been influenced to no slight degree by his associations with Dr. David Hosack, who was doing so much at that time to organize charities of various kinds in New York City. The old Kip estate, of which the Bellevue grounds were a part, contained originally 150 acres on the East River, extending from what is now about Forty-first street down to Twenty-sixth street. As there was a hollowing out of the river coast line here this portion of the East River came to be known as Kip's Bay, and the whole tract of ground as Kip's Bay Farm.

The Kips were descendants of Hendrick Kip, a thrifty tailor who came from Holland to the City of New Amsterdam some time about 1640.

In selecting this really very fine location for its almshouse and hospital, or rather for what afterward came to be considered its Department for the poor and for ordinary criminals, for prisoners were also to be housed in it, New York City was only following out the tradition of the liberal municipal generosity in the treatment of its poor that had characterized New Amsterdam from the very beginning of its existence. Even when the city had less than one thousand inhabitants there was a hospital in connection with its poor house and this was, by the way, the first hospital built upon the soil of what is now the United States. This was established toward the end of 1658 and existed down to 1680, when there is a record of the selling of what was known as the "old hospital," or "five houses," to be found in Toner's Medical Men of the Revolution.

As is noted by Dr. Carlisle at the end of the seventeenth century New York, though a mere village of 4,300 inhabitants, contributed for the support of her poor proportionately nearly one-half as much per capita of population as did London at the same time, which had at this period a population of nearly three quarters of a million and was considered one of the greatest cities in the world. He notes also that this expenditure was not the only source from which the indigent could draw relief. Besides the money provided by the municipal poor tax, which amounted to nearly $800 a year, a large amount was contributed by the Church, which had good endowments and was liberally supported by the members.

The first Poor House in New York, which is of interest to us in connection with Bellevue as the City Hospital because it contained a ward for the sick poor, was erected in 1735. Its site was that upon which the City Hall now stands. The instructions adopted by the Common Council for the Committee which was to oversee its construction, show once more the liberal spirit in which the old-time City of New York faced its municipal

The First Poorhouse in New York, 1736.

duties in this matter. Enough land was to be obtained so that the building might have a good yard and garden attached to it. The building was to be of good size for those times and the material was to be of stone. It was 56 feet long, 24 feet wide and two stories high with a cellar. The ward for the sick poor was about 25 feet square, situated on the upper floor on the Broadway side of the building and represents the first hospital accommodations provided within the limits of the present New York City.

This building was so substantial and well built that later on, when it was abandoned as a poor house and hospital it was readily converted to

Vicinity of the Poorhouse, 1763.

other uses and became the famous Scudder's American Museum for several years, while the Academy of Arts and the New York Historical Society also had rooms in it. The name of the New York Institution was given to it and such other charitable and educational interests as the Lyceum for the Deaf and Dumb and Professor Griscom's chemical lectures, a sort of popular course in chemistry in those days, were allowed quarters and all rent free.

It is interesting, too, to find that the first visiting physician at this original hospital in New York was a worthy predecessor of the distinguished medical men who have since occupied such positions in care of the city's poor. He was a pupil of the famous Boerhaave who had introduced the clinical teaching of medicine to the world and had practically revolutionized the medicine of his time. This first visiting physician in New York was Dr. John Van Beuren, a graduate of the Medical School in Leyden. Two of his sons, Beeckman and Abraham Van Beuren, were also physicians, the latter being the grandfather of the late Professor William H. Van Buren, the family having dropped the 'e' of the name in the interval.

It is not surprising, then, from what we know of the early history of New York's attempts to accommodate its poor, that, after the purchase of a magnificent location on Kip's Bay, the erection of a very substantial and even handsome building with all the architectural advantages considered necessary at the time was determined upon. During the year 1811, after the purchase of the ground, rapid progress was made in the building so that before the end of the year, nearly $50,000 had been expended. In 1812 came the war with England and the Common Council ordered the building committee to spend as little as possible though it did not positively require the work to be stopped. It was, therefore, not until 1816 that the main building of Bellevue Hospital, almost as we know it now, with the exception of the upper story and some of the pavilions at the rear, was finished.

At the end of April, 1816, the buildings were announced as ready and a formal opening ceremony was arranged. This was held on April 29, at twelve o'clock. The building was originally completed in three stories. It was 325 feet long, by 55 feet wide running not quite directly north and south with a north and south wing each 100 feet long by 55 feet wide.

This main building, however, was intended more especially for the poor and two special pavilions, 75 feet long by 25 feet wide, almost on the lines respectively of the present Twenty-eighth and Twenty-sixth streets were erected for hospital purposes—the northern one for male patients the southern for female patients.

Besides the absence of the unoccupied ground around the hospital, only one feature of the present situation of Bellevue would strike an inhabitant of New York of those days as very different from that which exists at the present time. What is now the main hospital building was then much nearer the river. The high water line came up to within a short distance of First Avenue. Otherwise things are mainly unchanged, the additional story that has been added to the main building at Bellevue, changing its appearance very little, as can be seen from the views given of the building as it appeared in those days.

The total cost of the institution as reported on its completion at the beginning of 1818, was about $425,000. The whole was enclosed by a stone wall, ten feet in height, and it was known as the Bellevue establishment. The grounds of the institution had been extended before the erection of the wall, so that they reached approximately as far as Second avenue on the west and Twenty-eighth street on the north, and ran as far south as Twenty-fourth street. The southern portion had formed a part of the old Rose Hill farm and was purchased in 1818. The name Rose Hill is still used in connection with this part of the town in certain ways, though the recollection of its origin is gradually fading away.

Before a decade had passed such was the growth of the city that it began to be realized that the almshouse and the hospital could not be accommodated at Bellevue and especially not if proper attention and sufficient room was to be given to the sick poor. Accordingly Blackwell's Island was purchased by the city and in 1828, after the erection of buildings on it, first the prisoners and later the paupers were transferred to it. The building had scarcely been given up entirely to hospital needs when a series of epidemics took place during which a number of doctors and medical students laid down their lives. In 1846, John James Lawrence, a medical student, died of typhus. In 1847, Drs. Porter and Van Buren went the same way. During the same year eight other resident physicians took the disease, but fortunately recovered. In 1848, no less than seven physicians died at their post; caring for typhus patients. Their names are on a glorious list of honor and deserve to be recalled every time that the history of Bellevue is spoken of. They were Beals, Blakeman, Cahoon, Green, Hedges, Seligman and Worth.

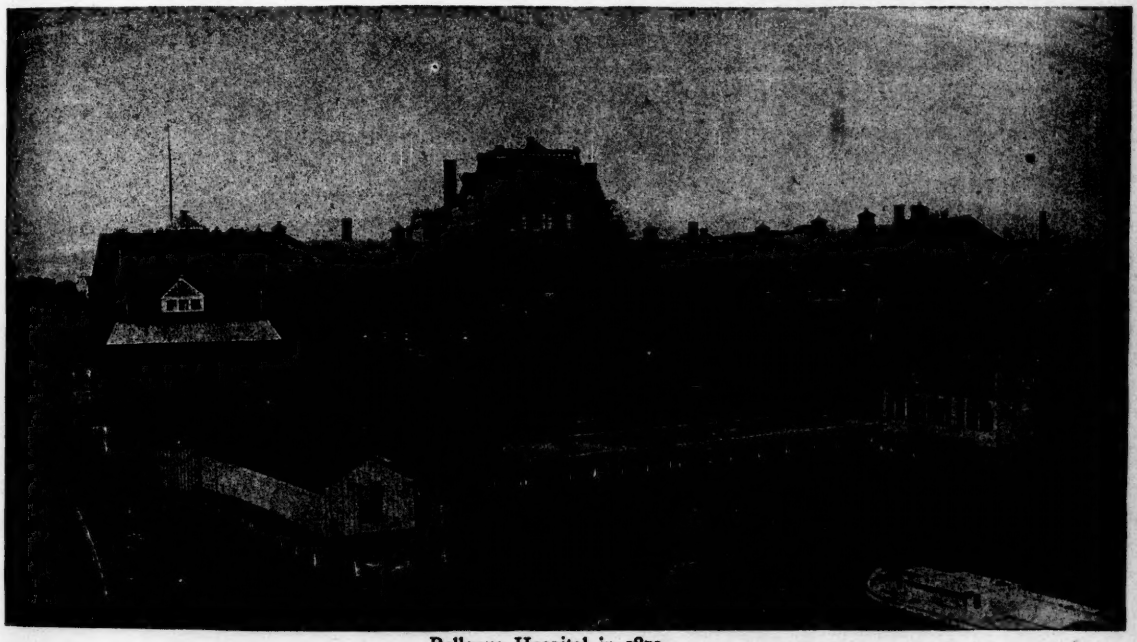
A sad piece of political history marred the Bellevue grounds in 1845. To quote Dr. Carlisle, "'the city's stepfathers,' as Dr. Francis has wittily dubbed the gang that went popularly under the name of The Forty Thieves, looked with envious eyes on the almshouse property and Bellevue received closer scrutiny than she had for thirty years before." This interest was, however, for selfish reasons. It was realized that a good political job could be made out of the sale of unoccupied land in and around the Almshouse. Accordingly all the region now extending from Second avenue to First avenue and from Twenty-sixth to Twenty-eighth streets, besides the land from Twenty-fourth to Twenty-sixth streets, lying along the river and west to Second Avenue, altogether nearly twelve acres, was cut up into building lots and sold at public auction. The public auction was a farce and the lots were bought in by those in the ring, who made a handsome sum of money. This sadly crippled the future of Bellevue and is a lasting disgrace to the city authorities of the time.

Perhaps the saddest part of this portion of the history of Bellevue is the fact that several medical schools offered to become purchasers of portions of this ground for the sake of the clinical facilities which the proximity to Bellevue would afford

them, but every offer on their part was rejected, because the publicity of the sales would almost surely reveal how much money the gang was making by this steal from the city. Since then, of course, Bellevue has been confined to its present much narrower quarters and the development that would surely have come long before this, only for the fact that more land was not available in the neighborhood, was prevented. It is this wrong that New York has ever since owed to itself to right.

The first important change in the old building at Bellevue came in 1854 when the wing extending eastward from the north wing of the old building along Twenty-eighth Street was erected. On this some $60,000 in all were expended and it was made four stories high, in anticipation of the raising of the rest of the building another story, the main hospital buildings, and though at the time the buildings were already nearly half a century old the medical and surgical staff of the time by their devotion of every energy to the work succeeded in making the hospital one of the model institutions of its kind throughout the world. It was not until after the introduction of antisepsis, and then later of aseptic methods, that the hopelessness of making such old buildings, originally built for living purposes alone, suitable for modern surgical purposes that physicians and surgeons realized the handicaps under which they worked.

About this same time an important addition was made to Bellevue in the shape of a pathological museum. This was due largely to the energetic enthusiasm of Dr. James R. Wood, and the building was determined upon in 1853, though



Bellevue Hospital in 1879.

which it had been determined must shortly be done. This new portion was formally opened April 23, 1855. The difference in the times between the original opening and this occasion was marked by the absence of any religious ceremonies in the second and by the fact that the principal address was delivered by the President of the Medical Board, Dr. John W. Francis, who was one of the most prominent physicians of the city and a President of the Academy of Medicine.

The next year, 1856, saw the completion of the project to add an additional story to Bellevue, but also saw a more important addition in the erection of an amphitheater for clinical teaching in medicine and surgery, capable of seating 600 persons. This was the most commodious operating theater in the United States at the time. Since 1856 there have been practically no changes in not completed for some years afterward. It was of brick, two stories high and the upper story was used as a pathological museum and also a lecture room on pathological subjects. It replaced the old dead-house, which had been for many years an eyesore on the ground and had come to be more than a suspected source of some of the infectious conditions that developed in the hospital. To the museum Dr. Wood presented a magnificent collection of pathological specimens, hence it bears his name and as it has been added to by many members of the Bellevue staff, it has become one of the most interesting pathological collections in the world.

In 1849, the Medical Board had resolved that it was unfortunate to allow the magnificent clinical opportunities for medical teaching at Bellevue to go unused. Some teaching was accordingly ar-

ranged for and after the improvements made in 1855-56 and the completion of the pathological department in 1857, this became regularly organized and took special importance as a department of the hospital. It was not until March, 1861, however, that definite arrangements were made for the establishment of a regular medical school and not until April of the same year that permission was granted by the Commissioners of Charities and Correction to erect a medical school building within the hospital enclosure.

In this same year, 1861, a series of typhus epidemics began, and, as is noted by Dr. Carlisle, for the seventh time in its history Bellevue physicians nobly responded to the calls made upon their time and strength and stood at their posts, though members of the house staff sickened and died. The disease began its ravages in 1863 and took with it Drs. Cook and King. In the following December and January, Rowe and Olmstead followed them. In April, 1864, Devlin and Dewey were martyrs to duty. Out of twenty-one members of the staff, fourteen contracted the disease and of these, six, as we have said, died.

Since 1860 the principal additions to Bellevue have been in the shape of pavilions and annexes and it is interesting to realize that these have been mainly the gifts of private individuals. The first one, called the Sturges' Pavilion, was built in 1879 and is intended for the accommodation of such patients as have just undergone capital operations. It is located just south of the northeast wing and runs parallel to it, being one story in height with a mansard roof. A second pavilion, somewhat resembling in outward appearance the Sturges and lying parallel to it, was built in the same year, 1879, by the Commissioners of Charities and Correction on the Twenty-sixth Street side of the grounds, and, because of the purpose for which it is designed, is known as the Insane Pavilion.

In 1883 a private benefaction once more made a distinct addition. It was erected by Messrs. F. and H. Marquand in memory of their brother, Josiah Penfield Marquand. The rear portion of this is occupied by a kitchen and rooms for the isolation of children suspected to be suffering from infectious disease, the character of which has not yet been determined. The rest of the building is divided between women and children. Four years later, in 1887, Mrs. Richard H. L. Townsend erected the Townsend Pavilion. This is some seventy feet in length, smaller than the other pavilions, and is for the use of the gynecological department. In 1890 Miss M. H. Dehon, at a cost of $6,000, built what is known as The Annex, consisting of a suite of seven rooms and an operating room at the west end of the Marquand Pavilion. The next year, Miss Josephine Lazareth obtained permission to build four rooms on the east end of the Marquand Pavilion, in order to provide accommodations for graduate nurses of the school who fell ill and who up to that time had been compelled to find places in other hospitals.

In 1892, one of the most important of recent improvements was in the erection of the new Alcoholic Pavilion, which is at the east end of the north wing, lying parallel to Twenty-eighth Street. As there is no other hospital in the city which receives these patients, Bellevue has to treat many thousands of them each year and this department of the hospital was very sadly needed.

It will thus be seen that Bellevue is a heterogeneous collection of buildings bearing no structural relation to one another, erected to fill the urgent need of the moment, often felt to be makeshifts and yet, under the condition of affairs that existed with no chance of any more coordinate method of improving and enlarging the hospital. The main building, the principal part of New York City's housing provision for its sick poor, comes down to us from nearly a century ago. Even the improvements made about half a century ago were necessarily designed on lines entirely that made them accord with the old-fashioned plan. Whenever Bellevue has been under the care of a Medical Board it has done good work, while, whenever it has fallen under political influences, results have been only too sad for the poor and only too costly for the city itself.

The most important change that has come for Bellevue in recent years has been the amendment of the city charter, which took the management of Bellevue Hospital, including the other city hospitals, Gouverneur, Harlem, Fordham and the Emergency Hospital for Women out of the hands of the Department of Charities and vested it in a Board of Trustees to be appointed by the Mayor, and who were to serve absolutely without compensation. These trustees were to be seven in number, the term of office to be seven years, with rotation that gives opportunity for one new appointment each year. This system has brought Bellevue under the same form of management as is now enforced for private hospitals in this city and in most of the other cities of this country.

Already the city hospitals have gained much from this new system. There is no doubt, however, that much more may be looked for from it. The recent proposal to replace the century-old building by a new, modern hospital building is what might be expected from a board of trustees who have the best interests of the city and the city's poor at heart and who appreciate all that New York City owes to its sick poor.

It would seem, then, that the history of Bellevue is really about to open up one of its most important eras under this new régime and as an amelioration of conditions has been sadly needed for many years it must be a source of congratulation to every one interested in New York City and especially its ailing poor that the greatest city of the western hemisphere is about to supply itself worthily with accommodations for those of its citizens who have no other resource but to throw themselves on the public bounty in the midst of their illness. When it is considered with what a handicap the medical and surgical staffs have

done their charitable work in the recent past and how much of their labor they have seen go in vain because of the unsuitable surroundings the crying need for quarters of our great metropolis of the West will be realized.

The plans for the new buildings of Bellevue Hospital, a brief description of which is here appended, have been made public by Dr. John Winters Brannan, President of the Bellevue Board of Trustees, in an address to the students of Columbia University on Friday, April 22. The preliminary work of the architects, McKim, Meade & White, in drafting, represented a single outlay of $75,000, and the construction calls for an expenditure of $15,000,000.

This magnificent building, of which it is hoped the city of New York will approve, is designed to occupy three full city blocks, from Twenty-sixth to Twenty-ninth streets, and First avenue to the East River. The extra land alone will cost $1,000,000 and a conservative estimate of the total cost of the institution is $14,000,000. It will be the largest, handsomest, and most completely equipped hospital in the world, and will accommodate some 2,500 patients. Quarters are to be provided for over 100 physicians.

The building material is to be Harvard brick, with light stone trimmings. In the center will be a dome, 100 feet in diameter and 200 feet in height, which may be utilized to provide apartments for some of the resident staff. It will be surmounted by stone pillars supporting a bronze figure.

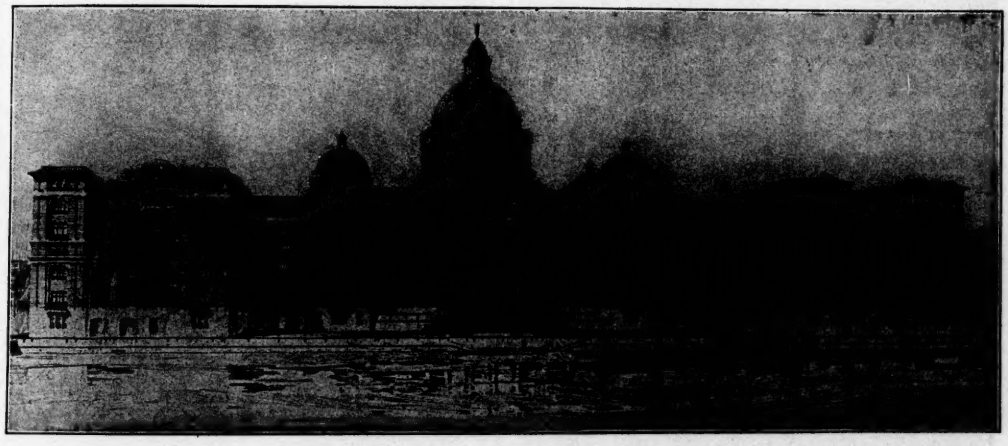
In addition to the city property to be purchased, the total structure will require two additional acres to be acquired by changing the bulkheads along the water front. The board of trustees of the hospital has permission from the War Department at Washington to make this change and the Street Cleaning Department would aid in filling in the space. The driving of piles would be an expensive item. The building is to be H shaped and, from the prospectus that has been prepared by the architects, is not, in general outline, unlike the Capitol in Washington.

The main part of the building will be 150 feet or more back from the river, and the wings running out on each side will form a large court.

Of course, it is not expected that there will be a demand on the hospital's full capacity as soon as it is built. On the contrary, it is expected that the new institution will meet the demands made by the city's growing population for a considerable time, and, besides, it will, it is said, be possible, with the present plans, to add four more pavilions when they are needed.

It would also be possible to leave off two pavilions of the thirteen that are contemplated in the present plans and still accommodate 2,000 patients. Under such circumstances the building would probably cost between $8,000,000 and $9,000,000.

The long arms of the building running east and west from the main part will front on Twenty-sixth and Twenty-ninth streets. The thirteen pavilions will all be under one roof, but between them will be covered arcades to allow a free circulation of air. Only four of the pavilions will face on First Avenue, and they will be used for the alcoholic, insane and other psychopathic patients, leaving to the others the benefit of the view and the air on the river.



Architects' Elevation of the New Bellevue Hospital Building.—View from the East River.

The appearance of the hospital from the river and from First avenue, where the main entrance will be, will be practically identical, except that, owing to the slope toward the river, the building will be one story higher on that side. It will be seven stories high on the river side. It will be 715 feet from east to west and 712 feet from north to south.

With the exception of the dome over the main part of the building and the curved roofs over four of the pavilions, which the architects, it is said, have added to accentuate the pavilions and lend architectural support to the dome, all the roofs are flat.

Roof gardens will be used by convalescent patients, who will be carried directly to the roof in seven elevators. These roof gardens will have temporary wards accommodating 100 patients. The roof will be surrounded by a four-foot parapet.

In the front, as well as in the rear of the hospital, there will be grass plots 300 by 500 feet, on which additional pavilions may be added if necessary.

The administration building, which will contain all the executive offices and libraries of the hospital and will provide quarters for 100 male nurses in the lower portion of which patients will be taken at night to receiving wards, accommodating 100, on the ground floor in the center of the long south wing.

The five upper floors of the south wing will contain the medical wards. The limit of each ward will be twenty-five patients, but several rooms will be connected with each, and may be filled with beds if necessary. The service rooms connected with every ward will be complete and modern in equipment.

A pavilion which will be near the present entrance to the hospital will have the three lower floors given over to the ambulance department and carriage house. The upper part will contain the medical amphitheatre, with accommodations for 200 students.

The west part of the long north wing will have quarters for 350 male employees on the three lower floors, while the upper floors will be devoted to the pathological department. Further east on the ground floor will be the kitchen, storerooms, and the boiler room.

The five upper floors of the north wing will contain the surgical wards. The surgical amphitheatre will be equipped with ten small operating rooms, all within easy access of the various wards and complete in every detail.

The hydropathic department, designed to surpass that of any public, or, probably, even private institution, and to contain bathrooms for both employees and patients, will be on the ground floor of the central pavilion. It will be equipped with all modern apparatus for the treatment of disease by water, and will be one of the most remarkable new features of the hospital.

There will also be an elaborate system of balconies on all sides of the hospital. Each of the ninety-two wards will have either an open or an enclosed balcony of sufficient size to accommodate all the patients in each ward at one time.

Architects' Elevation of the New Bellevue Hospital Building.—View from the West side.

Besides the approval of the board of trustees of Bellevue and Allied Hospitals and the Board of Estimate and Apportionment, it is not altogether improbable that the plans for the new hospital will have to be passed on by the State Board of Charities before they are accepted.

This board will probably request the trustees to submit their plans for approval.

The Bellevue trustees have contended that the city charter and the statutes required them to submit plans for the buildings under their jurisdiction to the Board of Charities merely "for advice," which they could follow or not, and not for "approval."

The plans of the new Bellevue Hospital were drawn by Messrs. McKim, Mead & White, to whom we are indebted for the illustrations and specifications of the new building.

ORIGINAL ARTICLES.

THE DIASTOLIC MURMUR IN DIAGNOSIS.*

BY AUSTIN W. HOLLIS, M.D.,
OF NEW YORK;
VISITING PHYSICIAN ST. LUKE'S HOSPITAL; CHIEF OF THE OUT-PATIENT DEPARTMENT; ATTENDING PHYSICIAN AT THE NEW YORK DISPENSARY.

THE study of the diastolic murmur presents more difficulties than are met with in the systolic variety. In its usual form it is simple and clear and its mere time and quality reveal the diagnosis in an instant, but no murmur can be more elusive in its site and intensity, while the possibilities of its characters are so numerous that they defy description as well as diagnosis. Eight varieties may be recognized.

The causes are aortic and pulmonary insufficiency, persistent ductus arteriosus, aneurisms, mitral stenosis, cardiorespiratory influences, pericardial, pleuropericardial.

1. *Aortic Insufficiency.*—In about 90 per cent. of the cases, the quality of the murmur is almost constant, being blowing and diminuendo. It follows the first sound after a slight pause and occupies the rest of the diastolic period, so that if the heart's action is not frequent the murmur is one of remarkably long duration. In the other 10 per cent. of the cases it may be rough, musical, rumbling, crescendo or of short duration, and may occupy any portion of the diastole.

The intensity varies greatly, in most cases it is marked, but no murmur can be more difficult to hear in slight cases or when compensation is failing.

The site of the murmur is not a fixed one in every case, in this feature it is unique. It may be heard localized at any point over the anatomical outline of the heart, but as a rule it has a point of maximum intensity from which it is transmitted downward toward the apex or to some extent upward along the great vessels or in any direction in proportion to its intensity. It is not often heard in the back unless the subject is thin and the murmur very loud, when it may be found between the inner border of the scapula and the spinal column. The points of maximum intensity in order of frequency are: just to the left of the base of the ensiform cartilage, over the second or third right spaces, over the third left space, in both instances near the sternum, and at the apex.

The cause of the varying point of maximum intensity is of great interest. When the murmur has its point of maximum intensity over the aortic area it is undoubtedly due to vibration of the aortic ring, but when it is elsewhere it must be caused by the impinging regurgitant stream producing vibration in that part of the wall of the ventricle where it strikes, but because of the mechanical differences at the point of the leak the direction of the regurgitant stream is not constant.

The diastolic bruit which may be heard over the great vessels by slightly compressing them with the stethoscope called Duroziez's sign, said to be a valuable sign of aortic insufficiency, is often hard to get, is not always constant and may sometimes be heard in anemia or marked dicrotism. I cannot consider it as more than an interesting curiosity.

A musical quality is not uncommon, in some instances a musical murmur can be heard across the room with the naked ear. This quality of sound is almost always produced at the aortic orifice by the vibration of a sharp edge of tissue, and in such cases it has its point of maximum intensity over the aortic area and is transmitted widely in all directions, especially downward. A musical murmur which recurs with some degree of regularity, say every few beats, is caused by a shifting stirrup of tissue which hangs from the center or edge of a diseased valve. When a musical murmur is localized at some other point than the aortic area it is due to the regurgitant stream producing vibration in a false band or chordæ tendineæ in the ventricle itself.

Roughness of quality is always due to conditions of the aortic orifice, and the murmur in such cases has its point of maximum intensity over the aoritc area, except in the so-called "Austin Flint murmur," which is localized at the apex and will be considered later.

Uniformity of intensity is uncommon, such murmurs are usually heard between the apex and end of the sternum. They have the swing of systolic murmurs and are often mistaken for such.

Shortness.—When a murmur is short and occupies an unusual period of the diastolic pause, one should always suspect some other cause than true organic aortic incompetency. In the cases which I have seen the cause has been due to a relative insufficiency from aneurisms, exceedingly great arterial pressure, or imperfect valvular coaptation from senile degeneration and anemia; the murmur being produced during the height of the arterial pressure and ceasing as it diminishes. Such murmurs vary with the arterial pressure and force of the heart's action, they come and go so that we may be led to think that we have confused an intense impure aortic sound with a murmur, but actually the murmur was present and disappeared. Murmurs which are short and occupy an unusual point of the diastolic period are almost always cardiorespiratory, but these will be considered later.

2. *Pulmonary Insufficiency.*—The diastolic lesion produced by this affection is much more constant in its quality and site than that of aortic insufficiency. Its maximum intensity is always just to the left of the sternum in the second or third spaces, it is transmitted by the wall of the right ventricle and unless intense is not heard at the apex. Its quality is usually more harsh and rumbling than the murmur of aortic insufficiency, and follows the first sound or systolic murmur which accompanies it more immediately in most cases and often seems like a continuation of the latter. The rumbling vibratory character is due

* Read before the St. Luke's Alumni Society, Dec. 11, 1903.

to the less rigid pulmonary ring and the lower tension of the lesser circulation. Pulmonary murmurs may be soft and blowing, but a musical quality is exceedingly rare.

3. *Persistent Ductus Arteriosus.*—A diastolic murmur from this cause is very infrequent. It resembles that of pulmonary insufficiency in quality and site, but it is usually shorter and more continuous with the systolic; this condition may be distinguished in some cases from pulmonary stenosis and insufficiency by less cyanosis, less clubbing of the fingers, a small right ventricle, and the more frequent presence of an accentuated pulmonary sound.

4. *Aneurismal Diastolic Murmurs.*—These are of two kinds; the first and most important is due to an actual aortic insufficiency, either relative, from stretching of the aortic ring or from implication of the valves in a degenerate process. In the majority of cases such murmurs have no distinguishing features in quality or position from the ordinary murmurs of aortic insufficiency, but in some instances the wall of the aneurism transmits the murmur to a much greater distance, especially to the right, while its quality may be more roaring, churning, or foundry-like.

The second variety of diastolic murmur caused by aneurism is quite uncommon; it is produced by the blood being forced out of a distended aneurismal sac through its narrow opening during the diastole. The point of maximum intensity is variable and depends on the situation of the aneurismal sac, it may be transmitted by the blood current or along the wall of the aneurism, it is a short murmur, and the intensity varies, depending on the force of the blood current and the size of the aneurismal cavity. Other signs of aneurism are usually present and are necessary for a correct diagnosis.

5. *Mitral Stenosis.*—In this condition three varieties of the diastolic murmur may be found. The most common and important is the so-called presystolic, of all murmurs this is one of the most unchangeable in its site and quality. Its maximum intensity is always at the apex, it is usually localized, but may be heard in some cases a short distance on either side of the apex. It is rough, rumbling and crescendo, running into the first sound which is short, high pitched and intense. The cause of this short intense first sound has been thought to be due to the small amount of blood in the left ventricle and the consequent ease with which it can empty itself, but this would hardly explain the sound in aortic insufficiency with a Flint murmur. I believe the most probable explanation is, that the coarse vibrations at the auriculoventricular septum stimulates the ventricle to a sudden contraction by irritation of the nervomuscular mechanism of the heart.

The duration of the presystolic murmur is variable, often it is a mere suggestion of a presystolic sound, but the first sound is always sharp if the murmur is present. While the presystolic murmur is generally due to mitral stenosis, it may be caused by aortic insufficiency. Such cases were first described by Austin Flint. The most likely manner in which the sound is made is by the forcing back of the mitral valves by the regurgitant aortic stream, an artificial stenosis being thus produced and the opposing auricular stream causing vibration of the mitral valves and a violent eddy. Why this effect is not always produced probably depends on the direction of the regurgitant aortic stream, and the state of tone or dilatation of the left ventricle, which may prevent it from being fully emptied during systole, thus allowing the regurgitant stream to lift the mitral valves. When a Flint murmur is present it is almost invariably accompanied by the regular diastolic murmur of aortic insufficiency, but in exceptional cases it is found alone. To distinguish this murmur from that of true mitral stenosis one must depend entirely on the character of the pulse, the size of the right and left heart, the intensity of the second sounds, and to some extent on evidences of pulmonary congestion and the history of the onset and cause of the disease. It is often impossible to make a correct diagnosis.

The second murmur, due to mitral stenosis, is long and somewhat rumbling or blowing, and occupies most of the diastolic period. The first sound may not be short and snappy. The murmur is heard between the apex and end of the sternum, and can only be differentiated from the murmur of aortic insufficiency by other signs.

The third murmur, due to mitral insufficiency, is heard just inside the apex and sometimes near the end of the sternum. It is very short, soft, and blowing, and occupies the first part of the diastole. It is due to the pent-up blood in the left auricle flowing swiftly into the left ventricle at the beginning of diastole, when the pressure in the ventricle is negative; the ordinary presystolic murmur is almost invariably present in these cases.

6. *Cardiorespiratory Influences.*—Murmurs may be produced in the lung tissue adjacent to the heart by the sudden change in the size of that organ which aspirates or expresses the air. Such phenomena are more common when the play of the lungs has been restricted by pleuritic adhesions.

Systolic cardiorespiratory murmurs are quite frequent and have often been described, but the diastolic have received very little attention, although they are by no means uncommon. They are frequently mistaken for organic murmurs, and such errors are serious when made by insurance examiners, or by the family physician. During the past year I have seen two men rejected by insurance examiners, and a young man who had been forbidden athletic sports for three years by his medical advisor on account of the presence of this murmur. They may be found anywhere along the anatomical border of the heart, occasionally under the clavicle on either side, more commonly the left, their most frequent sites are just above and inside the apex or in the fourth space just to the right of the sternum. I have never heard a diastolic cardiorespiratory murmur posteriorly, although the systolic is not uncom-

mon there. They are fairly well localized, more so than the systolic, but if intense they may be transmitted some distance. They occupy a portion of the diastolic period, but what portion is not fixed. As a rule it is heard immediately after the systole. The quality is fairly constant, either soft and blowing, or puffing. The intensity varies with respiration; there is always a certain period in the respiratory cycle when the murmur is at its greatest intensity, and another when it can scarcely be heard or is wholly inaudible. At its point of greatest intensity, if the breath is held the murmur is constant and uniform. In some cases the respiratory influence is very slight, even producing no greater change than may be caused by respiration on ordinary organic murmurs. These cases are very difficult of diagnosis, but the short duration of the murmur, its early occurrence and soft, puffy quality, together with the absence of organic signs, should make the diagnosis clear, but if the heart is enlarged, the pulse full and quick, and the second aortic sound accentuated, the problem may be exceedingly difficult or impossible to solve on the first examination.

7. *Pericardial.*—When pericarditis is present, both systolic and diastolic murmurs are heard at some time during its course, their time of occurrence alone distinguishing them. The quality is superficial, rubbing or grazing, soft or harsh. The intensity varies, often being loud and harsh, or very soft, but as a rule it is of medium intensity. Pressure with the stethoscope may intensify the murmur. The duration is generally shorter than that of endocardial murmurs, and the sound may be broken, making two short murmurs. It follows the first sound or murmur almost immediately, giving a to and fro quality. Its site at the beginning and toward the end of the disease is most frequently in the third and fourth spaces, just to the left of the sternum, but may be heard in severe cases quite widely to the right and left of the sternum, and as high as the first rib. It is not transmitted far. A very soft murmur may be difficult of diagnosis; on account of the faint apical impulse, massive cardiac dulness, especially upward, and feebleness of the first sound, which is often more intense upward over the third or fourth spaces, its pericardial nature may be determined.

8. *Pleuropericardial.*—This murmur differs from the former in only four main particulars; the site is always at or a little above and inside of the apex; respiration has a decided influence, for at some period of the cycle the murmur may disappear or become fainter, and there is always some point during the respiratory cycle when, if the breath is held, the murmur is best appreciated; other signs of pericarditis are absent; indications of dry pleurisy are almost always present.

The cases which I present illustrate some of the difficulties which I have set forth in this incomplete description of the diastolic murmur.

Case I.—Male; thirty-six years old; driver. His general health has always been good. No rheumatic history. He had a chancre eight years ago, no positive secondary symptoms. He came under my care a few weeks ago for pains in the right shoulder and the side of the chest. The cause of these was rather vague and did not improve under salicylates or potassium iodide. There were no other complaints. On physical examination nothing was found but a very slightly enlarged heart, and a very soft diastolic murmur in the fifth space just to the left of the sternum, which on some days was impossible to hear. The pulse was about ninety, somewhat larger and quicker than normal. It alone would give no clue to the diagnosis. I mention this patient to illustrate the ease with which such a case can be overlooked, as many of my best fourth-year students have examined him, but no one has made the diagnosis of aortic insufficiency.

Case II.—Male; housesmith; twenty-eight years old. He has a marked history of inflammatory rheumatism. Four years ago he was in St. Luke's Hospital for several weeks with an attack of acute articular rheumatism, and endocarditis with marked embarrassment of the heart action. This was not his first attack. He came to the out-patient department very soon after he left the hospital. The physical signs then were about the same as they are now. The heart is greatly enlarged in all directions, a loud diastolic murmur of a blowing quality is heard over the aortic area and is transmitted to the apex. At the apex a very loud systolic transmitted to the axilla is heard. The point of special interest is a localized, high-pitched, musical murmur in the third and fourth spaces close to the sternum. I believe that the musical sound is made in the ventricle through the vibration of a band. The case is also of interest because the man has been able to do hard work for three years.

Case III.—Male; thirty-two years old; porter. He has been under my care for some years at the New York Dispensary, attending irregularly, and usually appearing after a drunken spree. There is no rheumatic history. He had syphilis twelve years ago. He presents a very typical appearance of aortic insufficiency, throbbing vessels, big left heart, loud diastolic murmur with maximum intensity over the pulmonary area. The chief interest lies in a presystolic murmur at the apex which is a good example of the so-called Austin Flint murmur. The pulse, absence of a large right heart, and syphilitic origin rule out mitral stenosis.

Case IV.—Male; thirty-five years old; janitor. He has had no rheumatic or syphilitic history. He has had a chronic nephritis with considerable albumin for an unknown time. The heart is very slightly enlarged. In the second space just to the right of the sternum there is a visible and somewhat palpable pulsation, over which there is a moderate dulness. A diastolic murmur is heard over it and is transmitted toward the apex. The pulse is not quick or large, undoubtedly being influenced by the increased arterial tension and the presence of a small aneurism at the sinus of Val-

salva, but the murmur itself is due to an actual insufficiency of the implicated aortic valves.

Case V.—Male; thirty-seven years old; plasterer. He has always been strong and well, except for myalgic pains, which brought him to the dispensary. He has a moderately enlarged heart, and a strong pulse. Above and inside the apex there is a short diastolic murmur which is heard over a small area, its intensity is not uniform, but varies with respiration. Because of the pulse and character of the murmur it is undoubtedly an example of the cardiorespiratory variety.

Case VI.—Male; twenty-six years old; cutter. He came to the New York Dispensary a year ago for the same symptom of which he now complains, that is, dyspnea on exertion. He made two calls then and has not consulted a physician until last week, when he returned with the same difficulty. The physical signs show that the apex beat is one inch to the left of normal and rather diffuse, but not forcible. The right heart is apparently not enlarged, although it is impossible to determine a moderate enlargement by percussion. At the apex there is a very distinct, soft purring thrill and presystolic murmur, the first sound at the apex is short and sharp, but the second sound can be distinctly heard as well. Over the base the second sounds are of equal intensity. The pulse is large, soft and rather quick, about 80 to the minute, at the angle of the jaw a very distinct throbbing is visible. It would be impossible to regard this case as one of mitral stenosis, but although the symptoms and signs, except for the murmur, point to aortic insufficiency, one hesitates to make that diagnosis without the usual diastolic murmur.

Since presenting this case a soft diastolic murmur has appeared at the end of the sternum.

111 West Forty-seventh Street.

THE INFLUENCE OF BOVINE TUBERCULOSIS ON HUMAN HEALTH.*

BY MAZYCK P. RAVENEL, M.D.,

OF PHILADELPHIA;

BACTERIOLOGIST OF THE STATE LIVE STOCK SANITARY BOARD OF PENNSYLVANIA; ASSISTANT MEDICAL DIRECTOR OF THE HENRY PHIPPS INSTITUTE FOR THE STUDY, TREATMENT AND PREVENTION OF TUBERCULOSIS.

HAD your invitation to speak on this subject come to me in the year of the London Congress on Tuberculosis, I would have been obliged to have depended largely on theoretical considerations to defend my position, although even at that time I had collected a certain amount of evidence which convinced me of the correctness of my belief in the essential unity of tuberculosis as seen in man and in cattle, and in the intercommunicability of the disease between these two species of mammalia. Some of this evidence was presented at that Congress. The stand taken by Koch at that time had the effect of stimulating research in practically every part of the world, so that to-day we are in possession of facts that seem to me to be irrefutable. I will therefore confine myself as nearly as possible to well established facts, and to the conclusions which they justify.

Study of Tubercle Bacilli.—Study of cultures of the tubercle bacillus isolated from various types of tuberculosis in man and in animals has not yet shown differences which enable us readily to determine the origin of a given culture. The most marked and constant difference is the greater pathogenic power shown by the bovine bacillus for all experimental animals which have been used, with the possible exception of swine, which in my experience have proved so very susceptible to both races that it is hard to draw a distinction between them. Koch, however, includes swine among the animals which show a much greater susceptibility to bovine cultures than to those from human sources. The list of animals for which this greater susceptibility has been shown is a long one, including horses, cows, asses, goats, sheep, dogs, cats, rabbits, guinea-pigs, and our nearest relative, the monkey. The result is the same by every method of inoculation tried. It would then be a most remarkable and anomalous circumstance for man, who is one of the most susceptible of all animals to be immune, or even strongly resistant, to the most virulent race of tubercle bacillus yet discovered. It has most certainly not been shown that man possesses this immunity, and no one has been able to discover any special means of defense in the human body against the bovine tubercle bacillus. Until this is done we are bound to believe that, in common with all other mammalia, he shares this susceptibility to its ravages.

Variation of Virulence.—While it has been shown conclusively that a greater pathogenic power is the most marked distinguishing characteristic between the bovine and the human bacillus even this is not constant. You will recall, however, that Koch in 1901, held that this difference in virulence gave us a sure method of diagnosis between the two races. If the culture had power to cause general infection in cattle it was then certainly of bovine origin, while failure to do this proved it to be human. Replying to this, Prof. McFadyean said, "If a low degree of virulence for cattle is to be taken as the distinguishing feature of human bacilli there will be no difficulty in proving that the human disease is sometimes transmitted to the lower animals."

Confirmation of this has recently come from the Tuberculosis Commission appointed by the Imperial Sanitary Office of Germany. Kossel, in his preliminary report says that among seven cultures examined by them, four of which were isolated from cattle and three from swine, one was found which caused only infiltration at the point of inoculation, with some caseous foci in the related prescapular gland, and in one mediastinal, but without the generalization usually seen following inoculations of bovine bacilli. He concludes that "among bovine tubercle bacilli

* Read before the New York Academy of Medicine, Section on Pediatrics, April 7, 1904.

there can also occur differences with regard to virulence."

Koch and his followers are very active in making discoveries which have been known elsewhere for a long time.

Pathogenic action of the bovine tubercle bacillus for man.—Accidental inoculations in the laboratory and in post-mortem work on cattle have given us some opportunity of observing the effects of the bovine tubercle bacillus on man. I have reported four such cases, all of which resulted in the formation of typical lesions which required excision before healing took place. In two of these cases the bacillus was isolated and studied, excluding the possibility of infection from human sources. In one instance the recovered organism was compared with the original culture. A number of similar cases are on record. A common feature of all of them is their resistance to treatment, final cure resulting only after radical excision. In a case recently reported by Troje, which seems to be free from the objection usually raised, the disease extended up the arm and two years after the original infection had involved the glands of the axilla and sub-clavicular space. In a few instances general infection and death is reported to have followed these accidental inoculations, but the evidence is not entirely conclusive. A careful study of these wound infections, and comparison with similar infections with human tuberculous material, shows (1) that the bovine bacillus grows well in the human body under the most unfavorable circumstances producing typical lesions, and (2) that it shows for man at least as great pathogenic power as the human bacillus under identical circumstances. As the skin is known to be the most unfavorable tissue for the tubercle bacillus, we are justified in holding that organs and tissues which are known to be favorable soil for the growth of the human bacillus will prove equally favorable for the bovine organism.

Clinical Observations.—Clinical studies have not given us a great deal of aid in the solution of the question before us. We have, however, some 38 cases on record in which the evidence is very strong and convincing. All of them are open to the same criticism, as it is plain that all other sources of infection have not been excluded with certainty. This objection will always apply to clinical observations to a greater or less extent, but I do not consider that it is fair to exclude them on this account. With respect to other diseases such as typhoid fever, diphtheria and scarlet fever, we constantly accept without question evidence which is not nearly so strong as that we are asked to reject when tuberculosis is concerned. Much of the evidence on which the general belief in the respiratory invasion of tuberculosis rests is lamentably weak. If we question the accuracy of those cases in which death has followed accidental inoculation, or those other cases where milk from tuberculous cows appears to have been the cause of the disease, for the reason that all other sources of infection have not been excluded, we should apply the same strict methods of examination to those cases in which infection appears to have taken place through the respiratory tract and by exposure to the human disease. This has not generally been done. In our clinics and hospitals it is the rule to question the patient as to his or her family history, and if the answers show exposure to another case of phthisis, the source of infection is considered as demonstrated. No effort is made to exclude the use of tuberculous meat and milk, even if it were possible to get reliable data concerning these points. In this way has the great mass of our statistics concerning infection in tuberculosis been collected. The belief generally held that dried and pulverized sputum is the general infecting material is theory pure and simple. It is supported by very little experimental evidence, and no exact clinical evidence that I am aware of. Do not understand me to say that I disbelieve these teachings, for I do not; but I protest that Koch and those who follow him in disregarding the importance of bovine tuberculosis in relation to the human disease set up a standard of accuracy for their scientific opponents which they do not honor themselves.

Primary Intestinal Tuberculosis.—Those who doubt that tuberculous food products play any considerable part in the causation of human tuberculosis base their opinion mainly on the alleged rarity of primary intestinal tuberculosis. Koch says "that a case of tuberculosis has been caused by ailments can be assumed with certainty only when the intestine suffers first, *i.e.*, when a so-called primary tuberculosis of the intestine is found." It requires but little thought to see how misleading this statement is. It leaves out of consideration infection through the tonsils and upper digestive tract, and recent experimental work proves that no such dogmatic statement can be made.

Passage of Tubercle Bacillus Through Healthy Intestine.—As long ago as 1890, Dobroklonski working under Cornil, showed that the tubercle bacillus can penetrate the wall of the intestine of some animals without causing any demonstrable lesion, and that it does not require long to do so.

The late Prof. Nocard observed that if he drew blood from horses at certain periods of digestion, the serum would become contaminated even if divided into small lots of 100 c.c. On the other hand, if the bleeding was done during fasting, the serum could be preserved in liter flasks without loss. In seeking an explanation of this phenomenon, two of his students, Desoubry and Porcher, found that the chyle of dogs fed with soup containing considerable fat showed many colonies of bacteria when plated. When a plain bouillon without grease was given the chyle was free from bacteria. Nicolas and Descos have shown that practically the same thing holds true for the tubercle bacillus when ingested with fat. During the winter of 1902-1903, I have made similar experiments at the laboratory of the State

Live Stock Sanitary Board of Pennsylvania. The method was as follows: After keeping a dog under observation for some days to make sure that it was healthy, a purge of castor oil was given in order to rid the intestine of any substance which might injure the mucous membrane mechanically. At the end of this time a single meal consisting of equal parts of warm water and melted butter made into an emulsion, in which tubercle bacilli were stirred, was given. The dog was killed after three and one-half to four hours, during active digestion, and as much chyle as possible collected, together with the mesenteric glands. With this material guinea-pigs were inoculated. In 8 out of 10 dogs it was found that tubercle bacilli had passed through the intestinal wall, and from the extent of the lesions found in the guinea-pigs I feel justified in saying that the bacilli had penetrated in large numbers. In every case the entire intestinal tract of the dogs was carefully examined, and in two microscopic sections were made from several portions of the gut. In no case was any lesion found. These experiments prove that tubercle bacilli can easily penetrate healthy mucous membrane without leaving any trace of their path.

When we remember how directly the chyle passes up the thoracic duct and is thrown into the venous circulation near the heart, from which it passes immediately to the lungs, it does not seem unreasonable to claim that an infection through the intestine may first show itself in the lung, or, at least, that the lesion in the lung will be so nearly contemporaneous with that of the intestine that it will be impossible to say which is primary.

I have here the intestines and lungs of two monkeys which were infected by feeding with pure cultures of tubercle bacillus in a series of experiments on the comparative virulence of the human and bovine organisms. In both the lungs are extensively diseased. We were unable to find any lesion whatever in the intestine of one, and in the other (A45007) there was only a slight lesion, with caseation of three glands in relation to the upper portion of the tract. In this animal there was, however, enlargement and caseation of the cervical lymph glands, pointing to invasion through the tonsils or pharynx.

If these two specimens were shown without history most pathologists would pronounce them cases of respiratory infection, yet they were kept under conditions which precluded this possibility, and were tested with tuberculin before the experiment began. May not these experiments explain many of those numerous cases seen in children in which pathologists are unable to decide the mode of invasion? In the series of autopsies reported by Northrup in 34 out of 125 cases he could not determine the portal of entry.

Post-mortem Statistics.—I will not go into the consideration of post-mortem statistics, because I understand they are to be treated in another paper this evening. The figures concerning the primary lesion are not at all uniform. In England only have we anything like uniformity in the findings, which show a considerable percentage of primary intestinal tuberculosis for that country. It must be remembered that a single positive result is worth more than many negative ones, and it is impossible to explain away the figures given by such men as Carr, Guthrie, Shennan and Still.

Infection Through the Tonsils.—The numerous observations made of late years leave no doubt that the tonsils sometimes act as the port of entry for the tubercle bacillus. As well put by Baup, "discussion is only possible as to the greater or less frequency of these lesions, and their pathological importance," a position sustained not only by the work of other observers but by his own, in which he examined the tonsils from those cases only in which tuberculosis of the lungs was absent and other ports of entry could be excluded. Dieulafoy, by the inoculation of guinea-pigs, found tuberculosis in 15 of 96 cases. Latham, who was careful to employ only the interior portions of the tonsils, in 45 consecutive cases of children from three months to thirteen years of age, seen at autopsy, found seven which were tuberculous. One of the most recent studies of this subject is that of Friedmann, who examined the tonsils obtained from 91 children at autopsy, and 54 cases removed by operation, all but one of the latter under five years of age. Of the 91 cases, in three there was tuberculosis, probably not primary; in five there was tuberculosis, probably primary, with secondary involvement of lymphatic glands, intestine, and bone; in one the tonsils showed many tubercles, giant cells, and tubercle bacilli, the rest of the body being free; in seven (two with and five without tuberculosis in other parts of the body) the tonsils contained typical giant cells, but no bacilli could be demonstrated; in three giant cells attributed to other causes were found; in eleven, which showed extensive tuberculosis of other parts of the body, the tonsils were free, but showed scars; in four the tonsils were free, there being tuberculosis of the internal organs; in three bacilli were demonstrated in smear preparations, though no tubercles were found. In the remaining 54 cases tuberculosis was not found in any part of the body. Only one of the operative cases showed primary tuberculosis.

Friedmann concludes that tuberculosis of the tonsils is quite common in children, and that the infection takes place directly from food, and not through the lymph, blood, or by inhalation. In swine and in cattle infection through the upper digestive tract is very common.

Many corroborative facts could be added, but enough has been said to show the fallacy of looking exclusively in the intestine for evidence of infection by food. The lymph channels leading from the upper digestive tract empty into the large veins near the heart, so it is not hard to understand how tubercle bacilli which may penetrate the tissues in this region soon find their way to the lung. In illustration of what I have

said, I show here photographs of the tonsils and lungs of a pig infected by feeding a pure culture of tubercle bacillus. This animal was one of four, two of which were fed human and two bovine bacilli. All of them contracted general tuberculosis, most marked in the lungs, and ending in death. Three of the four showed lesions like those shown, but in only one could any injury of the intestine be found.

Isolation of Bovine Tubercle Bacilli from Human Lesions.—The most direct and positive proof that bovine tuberculosis is responsible for a certain amount of tuberculosis in man is given by the finding of the bovine bacillus in human lesions. With this object in view I began in 1900 to look for cases of intestinal tuberculosis in children as those most likely to be caused by the bovine bacillus. In June, 1901, I succeeded in isolating from the mesenteric glands of a child sent to me by Dr. Alfred Hand from the Children's Hospital in Philadelphia a culture which has been designated BB. This culture showed a most intense virulence for cattle, killing two calves in seventeen and twenty-seven days respectively, and a six year old cow in seventeen days. Excepting in the first generation when some irregularity of staining was noticed, this culture has always shown every characteristic of the bovine tubercle bacillus, and must be regarded as having come directly from cattle. I have since isolated two other cultures from mesenteric glands of children which have unusual virulence. Culture U was considered an ordinary human culture until it was used in some feeding experiments on dogs, when it showed such unexpected virulence that I inoculated a calf with it. The animal was killed after forty-six days, as it was moribund. The autopsy showed a general infection.

Recently I have obtained another culture which lies between BB and U, and which I consider bovine. It produces general infection and death in rabbits on subcutaneous inoculation, and killed a calf weighing 255 pounds in thirty-five days. The late Dr. De Schweinitz isolated the tubercle bacillus twice from intestinal lesions in children, and Dr. Theobald Smith has found it once in such cases. In Europe Febiger and Jensen report having found it three times, and Kossel speaking for the German Tuberculosis Commission, tells us that out of 16 children examined, four proved to have been infected by the bovine tubercle bacillus. Two of these four cases are described as "miliary tuberculosis," one starting from a bronchial adenopathy, and the other from a mesenteric adenopathy. The remaining two were intestinal tuberculosis. It appears from this that even those cases which show the primary lesion in the bronchial glands, and which are considered to be so certainly of respiratory origin, may be caused by the bovine tubercle bacillus.

When a Commission which is evidently doing its best to sustain Koch has to acknowledge that 25 per cent. of the children examined by it show lesions due to the bovine tubercle bacillus it seems time to abandon the doctrine that tuberculosis of cattle has little or no effect on human health.

It appears to me that the case might well rest on the positive evidence afforded already by the discovery of the bovine germ in children.

Frequency of Bovine Infection.—I will not attempt to say what proportion of children die of bovine infection. If I have sustained my contention that the two diseases are essentially the same and intercommunicable, it is evident that the number of children in any given locality who become infected from bovine sources will vary directly with the prevalence of tuberculosis in the cattle of that district, and with the extent to which unsterilized milk is used as food.

In order to determine the percentage of children who derive their infection from cattle it would be necessary to isolate from a large number of those who died from tuberculosis the offending organism, and to determine its origin. The cost of this is prohibitive for private laboratories, and it must be undertaken at the public expense if done at all. The findings already published are too few in number to form the basis of an estimate, but they show conclusively that it is not a rare occurrence to find the bovine tubercle bacillus in the lesions of children. The German Commission found it in four out of 16 cases examined; De Schweinitz twice in four cases; Theobald Smith once in five cases, and at the laboratory of the State Live Stock Sanitary Board I have found it in two out of five cases. Febiger and Jensen have found it in three instances.

Extent of Tuberculosis in Cattle.—I will not weary you with an array of statistics showing the prevalence of bovine tuberculosis. It is well known to be a scourge, and to be especially prevalent in milch cows of the herds on the dairy farms near large cities,—at least this has been the case in the past, to a great extent. The introduction of certified milk has had a widespread educational effect, and has done much to better the condition of many herds, directly as well as indirectly.

I hold strongly to the opinion that it is not only the cow with tuberculosis of the udder that is dangerous, though this is no doubt an especially perilous condition. Dilution with the milk of healthy cows undoubtedly lessens the infectiousness of such milk but cannot make it safe. Dr. Theobald Smith showed in 1893 that the tubercle bacillus could be found in the milk of tuberculous cows, when the udder was free from disease, so far as the naked eye could tell. In a series of experiments with the mixed milk of five cows which reacted to tuberculin, but were in good physical condition, I found it infectious for 15.8 per cent. of the guinea-pigs inoculated. No attempt was made to concentrate the bacilli; on the contrary, the whole quantity of the milk was well shaken in order to imitate natural conditions. No lesion of the udders could be found during life or after death of the cows.

Rabinowitsch and Kempner found that 10 out

of 15 cows, which reacted to tuberculin but showed no evidence of udder disease, gave milk containing tubercle bacilli. They conclude that "milk may contain tubercle bacilli; first, in beginning tuberculosis, without discoverable disease of the udder; and, second, in latent tuberculosis that can be detected only by the tuberculin reaction;" also, "milk from cows that react to tuberculin must be suspected of being infectious in every case."

Conclusion.—At the present time the weight of the available evidence is in favor of the view that the chief source of infection in children, as well as in adults, is the human tubercle bacillus, and that the portal of entry is the respiratory tract. It has, however, been proven conclusively that the bovine tubercle bacillus is responsible for a certain proportion of the deaths from tuberculosis in children, and there is strong evidence at hand to show that the number of children infected from bovine sources is quite large. Whether the number be large or small, it is none the less our duty to guard against the use of milk from tuberculous cattle for food.

CLINICAL ASPECT OF CHRONIC MYOCARDITIS.*

BY JOHN W. BELL, M.D.,
OF MINNEAPOLIS, MINN.;
PROFESSOR OF PHYSICAL DIAGNOSIS AND CLINICAL MEDICINE, UNIVERSITY OF MINNESOTA.

CLINICALLY, the ills which befall the heart may be divided into two broad classes: (1) Those due to pathologic changes in the valves, causing deformity and impaired function, and later, secondary changes in the heart muscle, and (2) those due to pathologic changes in the myocardium, causing cardiac insufficiency accompanied by enlargement. Clinically, structural disease of the heart means either deformed valves or weakened walls, leading sooner or later in either case to cardiac insufficiency with all its attendant evils.

Unfortunately, in the past, our text-books have given but little space to the consideration of chronic myocarditis, hence it is an imperfectly understood and much overlooked condition.

It is not my purpose in this brief paper to discuss the pathology or etiology of chronic myocarditis, except for the purpose of rendering more clear the clinical aspect of the subject.

Pathology.—Much diversity of opinion and confusion exist as to the pathologic changes present in chronic myocarditis. In this paper the term chronic myocarditis is used in its broadest sense to include any morbid changes which manifest themselves clinically in the weakened myocardium, the result largely of fibroid or fatty changes in persons at or beyond midlife, previously free from valvular disease. The microscope reveals a variety of pathologic metamorphoses, pointing as a rule to fibroid or fatty changes in the heart muscle, either circumscribed or diffuse in character.

* Read before the St. Louis County Medical Society.

Chronic interstitial myocarditis may and not infrequently does represent a later reparative stage of acute myocarditis, but more often it is secondary to conditions interfering with the nutrition of the heart, such as gradual narrowing of the coronary arteries or their branches, the result of endarteritis, atheroma, arterial fibrosis, or the more sudden and complete occlusion of the vessel by an embolus or thrombus. Localized changes, fibroid or fatty in character, are most frequently found in the walls of the left ventricle, posteriorly, toward the apex, causing local weakness and thinning, with pouching of the myocardium, aneurismal in character.

Etiology.—Males suffer from myocardial weakness much more frequently than females. The pathological changes in the myocardium are of slow and progressive development, the result of long continued injurious influences. These injurious influences, which fret and embarrass the heart, may come from within or without the organism, or, in some cases, there may be a union of both. My observation leads me to believe that the long-continued, even moderate use of alcohol, especially when associated with the use of tobacco, is one of the most potent factors in the causation of chronic myocarditis as we meet with it in American men. It is astonishing how promptly alcohol and tobacco aided by strong coffee (two or three times daily) will disturb the cardiac rhythm of the active, nervous, susceptible man of affairs. In susceptible persons disturbance of cardiac rhythm and rate, associated with an irritable condition of the heart, is noticeable soon after the tobacco habit is formed; in the less susceptible its injurious effects are delayed until midlife or beyond, and are observable in the form of more pronounced disturbance of rhythm, rate and force, associated with palpitation and precordial discomfort.

Tobacco, by increasing the rate and disturbing the rhythm, thereby increasing the labor as well as perhaps interfering with the perfect nutrition of the heart muscle, leads gradually to a degenerative change, and alcohol acts even more promptly in producing sclerotic changes.

Gout or the gouty diathesis, by paving the way for early stiffening of the arteries, including changes in the coronary arteries, is often visible in the background as a causative factor.

Syphilis, like gout, is often responsible for myocardial disease, especially fibroid changes. Among the more frequent causes may be enumerated coronary disease, general arterial fibrosis, chronic renal disease, endo- and pericarditis, anemia, phosphorus, etc.

Symptoms.—The rational symptoms of myocardial insufficiency, at first are usually vague and inconstant; not alone is this true of a series of cases, but of the same case at different times. Death may occur suddenly without evidence of symptoms or physical signs. Breathlessness, amounting to dyspnea on exertion, is one of the earliest and most constant symptoms. Slight vertigo, headache, precordial distress, palpitation

and later attacks of angina are among the more common symptoms. The pulse becomes irregular in rate, rhythm and force; perchance intermittent. Slight overwork or worry precipitates an attack of palpitation. Later dyspnea becomes more pronounced and constant, with attacks of severe cardiac asthma, especially at night. In other cases the breathing, waking or sleeping, is of the Cheyne-Stokes type, often accompanied by pulmonary congestion, edema, and later, hydrothorax; the latter often before evidence of fluid is noticeable elsewhere. In still other cases precordial pain occurs and later attacks of true angina, especially if extensive coronary disease is present. In other cases, especially of fatty heart, the patient may manifest muscular twitchings, pseudo-apoplectic attacks, with transient hemiplegia.

Without wearying you longer with a recital of symptoms, I feel sure you are all familiar with the following clinical picture: An active business man of sedentary habits, a free user of tobacco, a daily, moderate user of alcohol, and a generous liver, begins to suffer from breathlessness on the slightest extra exertion, also from precordial discomfort at intervals, especially if effort follows a full meal. Excitement, overwork or worry precipitates palpitation; he becomes painfully conscious of the presence of a heart; consults his physician who finds a pulse, usually irregular in rate, rhythm, force or tension, often intermittent. A physical examination of the heart and vessels reveals a weak, diffused impulse in the nipple line; arteries unchanged or slightly stiff. On careful percussion the deep cardiac dulness is found slightly increased. On auscultation the heart sounds may be practically normal, but as a rule the first sound is short and feeble, with variable accentuation of aortic second sound.

Unless the true condition is promptly recognized and counteracted by judicious treatment, we see the shortness of breath, precordial discomfort and other symptoms of myocardial weakness increase from month to month, gradually removing the once active man of affairs from his sphere of usefulness.

Diagnosis.—Chronic myocarditis gives rise to no pathognomonic signs, consequently in the early detection of the disease much depends on the judgment and experience of the clinician. He should keep constantly before him the fact that the vast majority of persons who begin to manifest signs of cardiovascular disease after midlife suffer from myocardial disease, rather than valvular. In the beginning of every suspected case of myocardial disease a complete history should be taken, especially as to age, family tendencies, habits and previous diseases. The urine should be carefully investigated for evidence of renal disease. The diagnosis is based largely on the history, age, state of the vessels, and symptoms, rather than on evidence of physical changes in the heart. In the majority of cases we must be content with a diagnosis of myocardial insufficiency; as to the exact nature of the myocardial changes present in a given case we can only speculate.

Treatment.—For the purpose of treatment we divide the clinical course of the disease into two periods or stages: (1) The period of progressive and often slow development of myocardial weakness, accompanied by breathlessness, precordial distress, irregular pulse, and occasional attacks of palpitation, and (2) the period of advanced myocardial weakness, accompanied by symptoms of pronounced cardiac insufficiency, such as constant precordial distress, dyspnea, cardiac asthma, Cheyne-Stokes breathing, frequent attacks of palpitation, marked irregularity of pulse, angina, tachycardia, bradycardia, Stokes-Adams quartet of symptoms, and later all the symptoms of general engorgement.

Each individual case must be carefully studied as regards the existence of any constitutional vice, the exact state of the heart and arteries, the character of the pulse, and the digestive powers. Having then a clear conception of the patient's condition it should be carefully and frankly explained to him, unless there be some special reason to the contrary, when it should be explained to a friend or relative.

If called to treat a case in the first period or stage our initial endeavor should be to discover and remove every possible cause of cardiac irritation and embarrassment. Our second endeavor should be to so regulate the diet, exercise and habits of the individual as to bring the general nutrition as well as that of the heart muscle up to the highest point and there maintain it. For this purpose, in addition to hygienic and dietetic measures, general tonic treatment, consisting, according to indications, of strychnine, arsenic and iron is indicated. The question of exercise must be carefully considered in relation to each individual case, and with special reference to the condition of the myocardium. In early cases the pathological changes are not far advanced, especially in obese persons, where fatty infiltration, rather than degeneration, is the rule, graduated exercise is especially beneficial.

However, in the large majority of cases of chronic myocarditis absolute rest in the recumbent position will be found necessary for a few weeks at least. The patient's habits should be carefully regulated; tobacco, alcohol, coffee and tea should be interdicted. He should be urged to lead a quiet, orderly and temperate life, as free from worry and excitement as is compatible with our modern civilization. The diet must be adapted to the digestive powers and the wants of the system. All rich, bulky foods, especially those inclined to induce flatulence, should be excluded. The patient should be advised to sleep and eat regularly, eating three meals daily, composed of concentrated, non-fermentative, nutritious food, suited to the requirements of his special case; the midday meal should always be the principal one; no solid food between meals; little or no fluid with meals. Patients should be

urged to sleep at least ten hours out of every twenty-four, with a midday rest of at least one or two hours following the midday meal, in order to minimize the daily labor of the heart; the latter injunction should be rigidly followed during the remainder of the patient's life. In dealing with this condition it is attention to such little things as relate to eating drinking and doing which makes success possible.

In order to intelligently advise and treat an individual suffering from chronic myocarditis, we must inquire carefully into his heredity as well as his past and present condition, also have clearly in mind the etiological factors responsible for the varied pathological changes present in chronic myocarditis. The fat, flabby man of sedentary habits suffering from fatty infiltration of the heart must, of necessity, receive different advice and treatment from that indicated in the thin, spare, ill-nourished individual. In the management of myocardial insufficiency we rely largely on rest, graduated exercise, massage, resisted movements, saline carbonated baths, tonics and saline cathartics. In suitable cases saline baths of a proper temperature aid very materially in restoring myocardial tone.

Before instituting a course of baths, advanced arterial fibrosis and aneurism must be excluded, also advanced cardiac insufficiency with dropsy. It is well to begin with a bath of ten minutes duration, which should consist of fifty gallons of water at a temperature of 98° F. gradually lowered to 94° F. The water should contain one per cent. of sodium chloride and one-tenth per cent. of calcium chloride. The temperature of the second bath is gradually lowered to 90° F.; thereafter all baths should be given at that temperature. The percentage of chlorides should be gradually increased, sodium three per cent. and calcium one per cent. and the bath prolonged to twenty minutes. As a rule, carbonic acid should be added by the tenth day. The baths, if beneficial, should render the pulse slower, fuller and more regular; should improve the character of the impulse, and should decrease the area of deep cardiac dulness.

The course of baths should extend over a period of five or six weeks, omitting it every fourth day. The principle underlying the baths is that the percentage of salines be increased, temperature lowered and duration lengthened. I consider it safer, and equally beneficial, to follow the plan suggested above of gradually lowering the temperature of the water during the first few times until the patient becomes accustomed to the cool bath.

Unfortunately, these patients do not present themselves for treatment until pronounced weakening of the myocardium, as shown by marked venous and visceral congestion has occurred, indicating the second or advanced stage of the disease.

We are then confronted with the problem of medicating a weak and degenerated heart muscle in an individual having, in the majority of cases by virtue of his age, suffered certain vascular, as well as extravascular changes, causing increased intra-arterial and cardiac blood pressure. In advanced cases absolute rest in bed must be enjoined, for a variable period, the length of time depending entirely on the indications present in that particular case. The question of the amount of rest indicated or required in a given case of myocardial insufficiency, demands the most careful consideration on the part of the physician in order to avert disaster.

The treatment of advanced cases of myocardial insufficiency, associated with pronounced venous and visceral engorgement, with evidence of beginning anasarca, is wholly palliative, directed to the relief of symptoms and associated complications. For the reduction of the more or less constant high arterial tension present in many cases we rely mainly on the iodides and nitrites. I have found iodide of sodium, in from three to five grain doses, three or four times daily, the most satisfactory agent in dilating the arterioles, thus reducing intra-arterial pressure; the action of the iodides is much more prolonged than that of the nitrites, hence the iodides are to be preferred.

Strychnine, digitalis, strophanthus, sparteine and caffeine render most excellent service in giving tone to the weakened heart muscle, when combined with a vasodilator like soda iodide, nitroglycerin, erythol or sodium nitrite. I desire to emphasize the value of long-continued, very small doses of digitalis, combined with a vasodilator, in myocardial disease associated with arterial fibrosis or chronic renal disease. In case the stomach is irritable, the urine scanty and the arterial tension low, it may be given by the rectum with good results. The morning saline, preferably magnesia sulphate, given one hour before breakfast, aided by an occasional bedtime dose of calomel, adds much to the comfort of the patient and aids greatly in delaying the evil presence of pronounced venous engorgement and anasarca.

In case angina pectoris occurs, the attack should be promptly met by the inhalation of amyl nitrite and the subcutaneous use of morphine and nitroglycerin. In view of the intense suffering associated with angina, the attendant should instruct the nurse, in case of an attack, to immediately administer a generous subcutaneous dose of morphine and nitroglycerin.

In the management of pronounced myocardial insufficiency, with its attendant evils, no method of medication has proved so satisfactory in my hands as that of subcutaneous medication, assisted by rest, massage, baths and saline cathartics. Our resources are sorely tried, in the treatment of this disease—a veritable struggle with mortality, often extending over a period of years —for it should be constantly borne in mind that we are dealing with an incurable condition.

In conclusion, I desire to emphasize the necessity for prompt recognition of the early symptoms of myocardial weakness, believing that no practitioner is justified in ignoring or passing over

as unworthy of therapeutic attention the breathlessness, precordial distress and irregular pulse so frequently encountered after midlife.

ACUTE APPENDICITIS AND ITS MEDICAL TREATMENT.*

BY G. N. BEST, M.D.,
OF ROSEMONT, N. J.

BY way of introduction it may be said that this paper is prepared from the standpoint of the general practitioner, or, to be more exact, from the standpoint of the country doctor; and if any excuse is needed for selecting so trite a subject for your consideration, it may be found in the fact that there are but few diseases he is called upon to treat that give him greater anxiety and more "worriment" than does acute appendicitis.

The reasons for this are obvious. In the first place, this disease is a variable one, and sometimes as treacherous as it is variable; its constitutional manifestations do not always indicate the gravity of the local affection and a case that appears to be progressing favorably for the first few days may, in an incredibly short time, present a condition quite the reverse of favorable. The diagnosis, moreover, is not always as easy as it is sometimes claimed to be. Not a little difficulty may be experienced in differentiating it from such diseases as cholecystitis, enterocolitis, intestinal obstruction, renal and biliary calculo, typhoid fever; in the female, from diseases of the uterus and its appendages, notably pyosalpinx and extra-uterine pregnancy and in the child from pleurisy and pneumonia. Spellissy[1] reports 190 cases with lesions of 20 varieties of structure and 68 species of lesion, all mistakenly considered to be of appendiceal origin.

In the second place, it may be stated that the numerous articles bearing on this disease, that have from time to time appeared in various medical journals and in reports of medical societies, instead of furnishing a trustworthy guide to its treatment, often embarrass and confuse the physician by a medley of diverging, not to say contradictory, opinions. While it is true that a number of the leading surgeons, both in this country and in Europe, especially such as are engaged in abdominal work, have declared with considerable unanimity that acute appendicitis is always a surgical disease from start to finish, and that to treat it medically is not only useless but wellnigh criminal; yet the rank and file of the profession have been slow to accept these teachings, inasmuch as they seemed too radical for general practice, not to mention the fact that at times they had a distinct commercialistic clang, which probably made them less acceptable than they would otherwise have been. But I have no hesitation in saying that as a general rule, to which there may be exceptions, it is easier for the physician and safer for his patient to have the appendix removed in the earlier stages of the disease than it is to trust to medical treatment. It would probably be still safer to have the appendix removed before it became diseased—if, indeed, there was such a time in the history of an individual—and I sometimes think that, while the surgeon is at work the removal in the male of both internal and external appendices might contribute not a little to the solution of certain social and economic problems now bearing heavily on the human family.

If operative measures were always feasible or permissible, in the cases under consideration, little more would need be said, but as they are not, and this is the plea I wish to be distinctly understood as making, I see no reason why their medical treatment should not be considered as we would that of any other disease. The assertion sometimes made that such treatment is not only useless, but even worse, is probably the outcome of a hysterical temperament subjected to undue pressure and not worthy the attention of serious-minded people.

Before proceeding farther in this discussion, it may be well to state what is to be understood by operative measures not being feasible or permissible. They are not permissible in those cases in which, after the attending physician has explained to his patient and to the immediate family the nature of the attack and that the chances for recovery are better with an operation than without, there is a direct refusal to allow it, usually coupled with the statement that Mr. Blank had appendicitis as badly as any one could have it and got well without an operation, and if *he* did, why should not I? The inference is plain: if the patient does not recover, it is the doctor's fault. While it is true that such cases are not so common as they were formerly, since operations have become fashionable and therefore more easily endured, yet I think that every practitioner of wide experience will confirm the statement that even now they are not altogether rare.

Again, if there is not a direct refusal, there is often a conditional assent, which amounts to the same thing, the patient reserving to himself the right to wait and see whether he is going to die or get well before he decides for or against an operation. It may be said that the objections to operative measures are simply a matter of prejudice, possibly of ignorance, twins as they usually are, and that it is the duty of the physician to remove them by the subtle art of persuasion. *Tempus fugit.*

It is, however, in country practice, in the sparsely settled rural districts, away from hospitals, away from competent surgeons and trained nurses, where railroads and telegraphs are few and far between, that we meet with cases in which operative measures are not feasible and where to carry out the surgical dictum To operate! To operate at once! is simply impossible. If the case in hand is a light one, removal to a

*Read before the Lehigh Valley Medical Association, Allentown, Pa., January 28, 1904.

hospital might aggravate it, and if grave, the patient is too ill to warrant the undertaking. The home environments, moreover, of many of these cases are not favorable to the after-treatment of a serious surgical operation. Another consideration which tends to complicate matters not a little: the physician not infrequently sees his patient for the first time some two or three days after the beginning of the disease.

Again, the medical man himself may be handicapped by certain conditions which make it questionable whether he will be in a position to render his patient the proper attention if he is subjected to an operation. It may be in midwinter when the roads are blocked with snow, or in early spring when they are impassable with mud, Obstetrical cases on the outer confines of his "bailiwick" may keep him on the ragged edge of expectancy a day or two at a time, several miles away from his patient. This is no fancy sketch, I assure you, but one that may be duplicated time and again by any one engaged in country practice. These people have bodies, I am quite sure, and souls, I am told, and when they are sick they must be attended to. If the treatment they receive is not the best that medical and surgical science can offer it is probably the best the conditions will allow.

A few words as regards the etiology and pathology of acute appendicitis. It has been but a few years since the younger surgeons, many of whom are now full-fledged, with a world-wide reputation, responding to an invitation to address a country society and selecting for their subject the disease under consideration, deemed it proper to carry with them a pocket full of foreign bodies, ranging in size from a grape seed to a tenpenny nail, to impress on their hearers the relation betweeen cause and effect. Now, it is thought that a true foreign body in the sense of its introduction from without and not of formation within the organism is but rarely the immediate cause of appendicitis. Concretions and fecal matter sometimes found in the appendix, are to be regarded as the result of a diseased condition of this organ, rather than the cause of it. *A subacute catarrhal condition of the intestinal canal* is probably at the bottom of many, if not most, cases. Boardman Reed[2] says it is "the duty of the medical man to prevent the occurrence of acute attacks of appendicitis. Often a long time before its actual outbreak there are symptoms that point to the gathering storm. There is constipation with intervals of diarrhea. There is often persistent and increasing anemia. In the urine there are signs of disturbed intestinal digestion. There is often obstinate gastric disturbance and especially increased acidity of the stomach. This gives rise to a catarrhal irritation of the intestines which also involves the appendix. If these symptoms are relieved before they terminate in pathological changes the appendicitis may be prevented." Frederick Treves[3] says that "in women the outbreak of appendicitis is often coincident with the menstrual period," and Deaver[4] that "the appendix is more liable to destructive inflammation because it is an organ now in the course of disappearance"—an assertion more easily made than proved. Dieulafoy[5] and Golouboff[6] consider acute appendicitis an infectious disease, and Lucas-Champonniére contends that it possesses an epidemic character. Dieulafoy goes so far as to call it a *maladie toxi-infectieuse;* and the more closely it is studied the stronger this view appears. In certain cases of a fulminant type the symptoms point to a toxemia, in some of which an operation within forty-eight hours will disclose a blackened appendix, cecum, and spots of the same character on the ileum and sometimes on the colon; this condition necessitating extensive resections of the intestinal canal.[7]

As in other infectious diseases, the poison may be so virulent, or the individual so susceptible to its influence, one or both, as to overwhelm the system from the onset, thus preventing the normal evolution of the disease and making the diagnosis extremely difficult, if not impossible. What particular germ of the intestinal flora is responsible for the toxins in question is not known to a certainty. Both the streptococcus and the colon bacillus have been accused of being the active agents. Suspicion, however, falls the more heavily on the former, and it is quite possible that when these germs are shut up in a diseased appendix the peculiar environments enable them to develop toxins which under more normal conditions would not appear; but, so far, this hypothesis is little more than a supposition and it remains for the pathologist to favor us with more exact data.

In this connection the observations of Simonin[8] are worthy of consideration. This author presented a series of 18 cases of general infection, severe scarlet fever, erysipelas, mumps and infectious angina, in which were observed positive signs of inflammation of the appendix.

"This organ," he says, "may be considered as a kind of tubular ganglion which takes part during the course of general infection in defense of the economy and receives the germs by the circulation of the blood as well as of the lymph. The first degree of inflammation of this organ, which might be called appendical folliculitis or adenitis, is shown by pain at the point of McBurney. This is also called latent catarrhal appendicitis. The second grade presents a peri-adenitis, that is to say, an inflammation of the cellular tissue around the appendix. The inflammatory reaction may propagate this as far as the mucosa and the peritoneum. Then follows a crisis or a colic of the appendix more or less acute, with distinct pain, nausea, vomiting and signs of peritonitis. Finally, an appendicitis with abscess may develop after perforation has occurred. The streptococcus is certainly the most frequent agent. Most of these appendicites arise from this germ. It is the same germ which is present ordinarily in angina, erysipelas, scarlatina, grip, measles, smallpox, and it may be the initial agent

of infection or associated with some other. Certain authors consider sclerosis of the appendix with obstruction, which one sees so often at autopsies, the result of several attacks of inflammation, latent, subacute or acute, which have occurred during infectious diseases. Such infectious diseases commonly occur during childhood."

If a fresh example were needed to show the limitations of human judgment, the conflicting views advanced from time to time as regards the proper treatment of acute appendicitis would furnish it. In this country most of the talking has been done by the class known as operators who have taken considerable pains to fly the red flag full in the face of their medical confrères; but present indications favor the hope that we have passed the crisis of indiscriminate operating and that we are now on a foundation in which more conservative and more judicious counsel will prevail. At the last meeting of the American Medical Association the surgical section unanimously "agreed that operation for appendicitis should be done the moment the condition was diagnosed, if the symptoms pointed to a limitation of the disease to the appendix itself. After involvement of the peri-appendicular structures the treatment of the case should be along the lines suggested by Ochsner, namely, frequent gastric lavage, absolutely no food or medicines by the mouth, rectal feeding unless it produces pain. Patients who had passed the primary involvement of the appendix, when subjected to this treatment recovered sufficiently to be operated on in 97 per cent. of cases, said operation being followed practically by no fatality."[9]

In his recent paper, read before the Medical Society of Kings County, Dennis says "that the pendulum has swung too far toward indiscriminate operation, but now the introduction of the interval operation has brought the pendulum back to swing within its proper limits."[10] A little more emphatic, but in the same line, are the remarks of an eminent professor of abdominal surgery in one of our medical colleges. In addressing his senior class he said, "Gentlemen, let me impress on you the fact that every case of appendicitis is not a surgical one. The professional cutter who wants to slash every patient who has a pain in his right iliac fossa is a dangerous animal to run at large in any community. Surgery is the noblest of professions, but the basest of trades. Nothing can compensate for the want of skill; but the morbid desire to cut, with no conscience to restrain, makes the doctor very unsafe, although a man of ability."[11]

It is not, however, within the scope of this paper to discuss the surgical treatment of acute appendicitis except in a general way, and then for the light it may throw on the management of those cases in which operative measures are not feasible or permissible, at least during the acute attacks. Personally, I do not wish to be understood as being adverse to surgical interference. I make use of it in my own practice and am fully satisfied that by this means many lives have been saved. On the other hand, I am just as fully satisfied, although it may be difficult to make it so appear, especially to those who are inclined to think differently, that not a few have been lost which would have recovered without it. That this contention is not entirely without foundation is evident from the fact that Dennis, in the paper already cited, says that "the mortality of the simple operation (that is, for catarrhal cases) is appalling in the hands of an inexperienced surgeon. The writer has knowledge of one surgeon who operated on 19 consecutive cases with 19 deaths." Surely it could not be said this surgeon was without experience when he operated on his nineteenth case! Dennis goes on to say that "it would seem that surgery had reached its climax in regard to operation for appendicitis; yet the time will never come when there will be no death rate. Complications are certain to arise that are beyond the control of the surgeon." Until it can be shown that by surgical treatment there is no death rate, is it not ungracious indeed to send out in flaming headlines when some unfortunate has succumbed to this disease: "Another victim of the medical treatment of appendicitis!"? Is it not reasonable to suppose that the result might have been the same under surgical treatment?

Although no reliable statistics are available showing the mortality of this disease under medical treatment, taking one case with another as they occur in general practice, yet it may be fairly approximated at somewhere between 10 and 15 per cent. Ill[12] says that "while there is no doubt that nine out of ten cases of appendicitis may get well without operation, it is the tenth case we want to save"; and Dennis (*loc. cit.*) that "the mortality in appendicitis in all cases under medical treatment is about 16 per cent. . . . and the mortality under surgical treatment about 4 per cent." He fails to state, however, on what authority these assertions are made. Obviously hospital records ought to show the death rate under surgical treatment but not under medical. It is possible that the figures which this author gives are "bold approximations," for in speaking of the advantages of early operations, he cites Fowler, whose 127 cases operated on within forty-eight hours showed a mortality of 17 per cent., just 1 per cent. more than Dennis allows under medical treatment. The truth seems to be that surgical cases, taking them as they occur in a general hospital, show a death rate of somewhere between 5 and 12 per cent. These figures refer to the present time; formerly the percentage was much higher.

No less an authority than Deaver claims that "cured cases are illusory. There is always a focus left in which the tissues are less resistant. Subsequent attacks are almost sure to occur. No one, no matter what his experience, can foretell the course of appendicitis or how severe the next

attack will be. To permit pus formation without surgical intervention is almost a crime. The ordinary medical treatment for appendicitis is little better than high-grade Christian Science."[13]

While I am quite willing to acknowledge that I know but little about gradations in Christian Science, I do know that these cases get well, and what is more, I know they continue to be well, at least as far as the appendical trouble is concerned. Among many disadvantages, the country practitioner, in whose cases of acute appendicitis surgical treatment is often neither feasible nor permissible, has one advantage, namely, an opportunity to study the natural history of the disease. This is denied to his surgical brother, who imagines that every case must be operated on and that right speedily. The country practitioner learns by careful observation that these cases are not so fatal as they are made to appear, that in the vast majority they recover, and that, too, without the troublesome sequellæ of strictures and herniæ which not rarely make life not worth the living. And while it is true that no one can foretell with absolute certainty at the onset of an attack of appendicitis what the result will be, the same is equally true of many other diseases.

It is evident that no fast rules can be followed in the management of acute appendicitis. Much must be left to the individual judgment of the attending physician. In those simple cases, sometimes called irritative or catarrhal, but little medical treatment is needed during the immediate attack. A thorough evacuation of the bowels is of the utmost importance. For this purpose small and frequently repeated doses of calomel may be given with advantage, followed, if necessary, by a saline cathartic or a copious enema thrown well up into the bowels. If it does not offend the stomach, a large dose of castor oil answers the purpose most admirably. If pain is a prominent symptom, small doses of the deodorized tincture of opium are advisable with either hot or cold applications to the affected side. These attacks usually subside in from two to five days, during which time the patient should be kept in bed and allowed but little nourishment and that of the blandest kind. Since about 30 per cent. of these cases have more than one attack an interval operation should be carefully considered by the physician and his patient, who should be instructed not to allow his bowels to become constipated and to exercise discretion as regards his diet. The following mixture, which may be given continuously for two or three months or even longer, if desired, and in which the amount of cascara may be increased if it is found necessary, is to be recommended as a preventive measure.

℞ Sodii salicylatis (pure) ..... ℥ij
Ext. Cascaræ sagradæ Fld. (P. D. & Co.) . ℥ij
Ol. Menth. pip. ..... gtt. j
Aquæ puræ ..... ℥j
Syrupi ..... q.s. ad ℥viij
M. et sig.: Teaspoonful before each meal.

In cases in which pus formation occurs the attacks are more protracted and more severe. *An abscess is nature's method of curing a diseased appendix;* and while she may not always succeed, she does so more frequently than one would expect. Sir Frederick Treves, in commenting on the advisability of an operation after a first attack, says that "if there has been an abscess in the first attack then I think an operation may be put out of court altogether because that abscess will in certainly 95 per cent. of the cases obliterate the organ and render it harmless."[14] This statement agrees so perfectly with my own observations that I have not the least doubt of its correctness. Since an abscess, originating in inflamed and necrotic tissues in any part of the body, does not usually reach its full development under one week's time or sometimes even longer, we should not expect an appendiceal abscess to show well-marked improvement in a shorter period; but as long as the tenderness does not extend beyond the median line and a highly sensitive and clearly circumscribed tumor is manifest, a hopeful prognosis may be entertained if not always expressed. While it is possible for these abscesses to empty themselves into the peritoneal cavity or to point externally, or for the pus to work its way into the stomach or the bladder, such cases are exceptional. In the vast majority they discharge their contents directly into the intestinal canal and the patients speedily recover. It would not be difficult to cite a number of instances proving the accuracy of this observation.

As in the catarrhal form it is advisable to commence the medical treatment of these cases by brisk purgation, and I agree with Lucas-Championniere in deeming it desirable to keep the bowels open during the entire course of the disease. As pain is usually a prominent symptom, it should be combated by opium and hot poultices, the latter I think decidedly preferable to ice-bags, as they are undoubtedly more agreeable to the patient. It is not necessary to carry the narcotic to the point of stupefaction. I usually advise the occasional smearing of the sensitive area with ichthyol ointment and the internal administration of tablets of salol and phenacetin, one every four hours. If the disease takes on a well-marked septic form, with high fever and profuse sweating, as it sometimes does, quinine, with or without turpentine, is indicated. But little nourishment should be allowed and this of the most easily digested kind. Patients usually do best with as little as possible. The Ochsner treatment, the so-called "starvation treatment," may be admissible in hospital but, for obvious reasons, not in country practice.

Incidentally, it may be said that in those cases in which the abscess ruptures into the peritoneal cavity surgical interference is always indicated. While it is possible to recover under medical treatment they do so but rarely.

Lastly, we shall consider the disease in its fulminating form. Whether this form is a variety of

acute appendicitis or a distinct disease is an open question. As before stated, its symptomatology points to a profound toxemia. It is quite different from a general peritonitis, set up by the rupture of an abscess into the peritoneal cavity. Its course is more rapid; nausea and vomiting are well marked and continuous; the pulse is usually rapid and small, the temperature variable, rarely high, sometimes subnormal; facial expression exceedingly bad; no tumor is apparent and the right iliac fossa but slightly, if any, more sensitive than the left; pain is usually referred to the region about the umbilicus or to the epigastrium; the abdomen is distended and the bowels resist purgative measures; mental apathy or stupor, with intervals of great restlessness, is not infrequent. These are the cases that the surgeon does not see in time and the medical man entirely too soon for his comfort. Whether under surgical or medical treatment they usually terminate fatally, and that, too, within a week, not rarely at the end of two or three days.

REFERENCES.

1. Annals of Surgery, June, 1902.
2. MEDICAL NEWS, June 8, 1901.
3. British Medical Journal, June 28, 1902.
4. MEDICAL NEWS, June 8, 1901.
5. Journal de Médecine et de Chirurgie, Dec. 10, 1898.
6. Prakt. Vratch, No. 29, 1903.
7. MEDICAL NEWS, June 8, 1901, p. 913.
8. MEDICAL NEWS, March 1, 1902, p. 419.
9. MEDICAL NEWS, May 16, 1903, Editorial.
10. MEDICAL NEWS, January 9, 1904.
11. Medical Brief, September, 1903; paper by G. C. Abell.
12. Paper read before Hunterdon County (N. J.) District Medical Society by Edward J. Ill, October 23, 1900.
13. MEDICAL NEWS, June 8, 1901; Report of the American Medical Association for 1901.
14. Lancet, June 28, 1902.

SUMMARY OF AN EXPERIMENTAL RESEARCH INTO THE USE OF ALCOHOL, NITROGLYCERIN AND AMYL NITRATE IN SHOCK AND COLLAPSE, WITH ILLUSTRATIVE PROTOCOLS.

BY GEORGE CRILE, M.D.,

OF CLEVELAND, OHIO.

Alcohol.—In the experiments reported the immediate effect of intravenous administration was observed. The first effect usually noted was a decline in the blood pressure. In the majority of such instances a compensatory rise followed; in a number of instances no change in this respect was noted; in but few was there a rise in the blood pressure. The average length of the stroke of the manometer (height of pulse-wave) was increased. There was no evidence that the heart beat more forcibly. In animals reduced to varying degrees of surgical shock the usual effect of an average dose of alcohol was the production of a further depression; in smaller doses but little effect was noted, while in larger doses a more marked decline often occurred. In a few instances, in deep shock, the administration of a considerable dose was followed by almost immediate death. In a number of experiments with alcohol the decline in the blood pressure was as prompt and as marked as in the administration of the amyl nitrate and nitroglycerin. In no instance, in the normal animal, did death immediately follow the largest dose of alcohol, but the more profound the shock the more marked was the depressing effect of alcohol. In a number of experiments alcohol was given prior to procedures intended to produce shock, but it is not certain that it rendered the animal more susceptible, although it is quite certain that the susceptibility was not diminished.

Nitroglycerin and Amyl Nitrite.—The immediate effect of nitroglycerin and amyl nitrite upon the pulse was an increase in its volume and a decrease in frequency. The immediate effect upon the respiration varied. At times there was a slight increase, more frequently a slowing of respiration. The immediate effect upon the blood pressure in almost every instance was a fall. The decline was usually rapid. There were but few exceptions, and in these there was usually no effect. A rise in the blood pressure was rarely observed. In the latter it was but temporary and usually followed by a fall. The descent in the blood pressure was gradual and rather rapid, the ascent, more gradual. Compensation usually took place in a few minutes, the rising curve being more gradual than the falling. The portion of the curve representing the deepest part of the decline was rounded. Compensation in the majority of experiments was complete. In those experiments in which the later blood pressure was not equal to that before the administration of nitroglycerin it was usually lower. Each time the doses were repeated the effects were almost as marked as the preceding time, even when the repetitions were at short intervals. On administering repeated doses, each twice as large as the preceding one, the effects were proportionately increased. Most of the animals tolerated very large repeated doses; excessive doses produced convulsions and respiratory failure. The blood became darker before the animal died.

During the convulsions the blood-pressure rose and fell with the muscular spasms. In the experiments in which the animal was in deep shock and the blood pressure gradually falling, there was no evidence to show any decrease in the rapidity of the decline. On the contrary, as nearly as could be estimated, nitroglycerin distinctly increased the rapidity of the decline. The effect of nitrate of amyl was in every respect similar to that of nitroglycerin. In many instances the heart beat irregularly after the injection. On the whole, nitroglycerin and amyl nitrite increased shock.

Experiments.—Alcohol.

Dog 1, male mongrel; excellent condition; weight, sixteen kilos. Dog 2, female mongrel; excellent condition; weight fourteen kilos. Dog 3, male mongrel; excellent condition; weight, nine kilos. The tracheal and carotid canula were applied. Ether anesthesia.

At 12:05, dog 1, blood pressure, 140 mm.; stroke, 12 mm.; pulse, 140; respiration, 80. Dog 2, blood-pressure, 112 mm.; stroke, 13 mm.; pulse, 156; respiration, 80. Dog 3, blood-pressure 98

mm.; stroke, 18 mm.; pulse, 152; respiration, 10.

At 12:45, the animal was reduced to shock by skinning and irritating the denuded surfaces. Dog 1, blood-pressure, 115 mm.; stroke, 10 mm.; pulse, 144; respiration, 92. Dog 2, blood-pressure, 95 mm.; stroke, 18 mm.; pulse, 132; respiration, 76. Dog 3, blood-pressure, 50 mm.; stroke, 20 mm.; pulse, 128; respiration, 52. In dogs 1 and 2 the sciatics were electrically stimulated. A sharp fall was recorded, followed by a gradual rise. In dog 3 a sharp rise and fall, with a gradual return to the former level, was noted.

At 12:50, dog 1, blood-pressure, 125 mm.; stroke, 10 mm.; pulse, 132; respiration, 88. Dog 2, blood-pressure, 80 mm.; stroke, 18 mm.; pulse, 132; respiration, 72. Dog 3, blood-pressure, 70 mm.; stroke, 16 mm.; pulse, 132; respiration, 56.

From 12:51 to 12:53 an injection of 22 minims of whisky was administered. An increasing pulse rate, slower respiration and a rise in the blood-pressure in each animal followed.

At 12:54, dog 1, blood-pressure, 130 mm.; stroke, 16 mm.; pulse, 148; respiration, 68. Dog 2, blood-pressure, 75 mm.; stroke, 18 mm.; pulse, 160; respiration, 60. Dog 3, blood-pressure, 70 mm.; stroke, 18.; pulse, 148; respiration, 48.

At 12:55, the sciatics were stimulated, with results similar to the previous stimulation.

At 1:02, dog 1, blood-pressure, 110 mm.; stroke, 12 mm.; pulse, 148; respiration, 76. Dog 2, blood-pressure, 75 mm.; stroke, 19 mm.; pulse, 144; respiration, 56. Dog 3, blood-pressure, 80 mm.; stroke, 16 mm.; pulse, 144; respiration, 48.

At 1:02-30, dog 1, an injection of 22 minims of whisky was administered.

At 1:02-30, dog 2, an injection of 22 minims of whisky was administered.

At 1:03-45, dog 3, an injection of 22 minims of whisky was administered.

At 1:05, dog 1, blood-pressure, 115 mm.; stroke, 12 mm.; pulse, 148; respiration, 64. Dog, 2, blood-pressure, 70 mm.; stroke, 20 mm.; pulse, 168; respiration, 52. Dog 3, blood-pressure, 80 mm.; stroke, 16 mm.; pulse, 152; respiration, 44.

At 1:08, the sciatics were electrically stimulated; the results were as before.

At 1:13, dog 1, blood-pressure, 112 mm.; stroke, 10 mm.; pulse, 144; respiration, 80. Dog 2, blood-pressure, 70 mm.; stroke, 12 mm.; pulse, 152; respiration, 52. Dog 3, blood-pressure, 75 mm.; stroke, 13 mm.; pulse, 132; respiration, 48. An injection of 22 minims of whisky was administered in dogs 1, 2 and 3. The results were as follows: Dog 1, blood-pressure, 115 mm.; stroke, 10 mm.; pulse, 144; respiration, 68. Dog 2, blood-pressure, 68 mm.; stroke, 10 mm.; pulse, 152; respiration, 52. Dog 3, blood-pressure, 80 mm.; stroke, 13 mm.; pulse, 132; respiration, 44.

At 1:38, dog 1, blood-pressure, 118 mm.; stroke, 10 mm.; pulse, 150; respiration, 60. Dog 2, blood-pressure, 60 mm.; stroke, 11 mm.; pulse, 156; respiration, 64. Dog 3, blood-pressure, 74 mm.; stroke, 17 mm.; pulse, 152; respiration, 48.

At 1:38-15, dog 1, an injection of 22 minims of whisky was administered.

At 1:38-30, dog 2, an injection of 22 minims of whisky was administered.

At 1:39, dog 3, an injection of 22 minims of whisky was administered.

At 1:41, dog 1, blood-pressure, 115 mm.; stroke, 11 mm.; pulse, 144; respiration, 68. Dog 2, blood-pressure, 60 mm.; stroke, 8 mm.; pulse, 156; respiration, 52. Dog 3, blood-pressure, 70 mm.; stroke, 16 mm.; pulse, 112; respiration, 144.

At 1:43, electrical stimulation of the sciatics was made with former results.

At 1:52-30, dog 1, blood-pressure, 115 mm.; stroke, 10 mm.; pulse, 156; respiration, 64. Dog 2, blood-pressure, 70 mm.; stroke, 8 mm.; pulse, 156; respiration, 52. Dog 3, blood-pressure, 55 mm.; stroke, 16 mm.; pulse, 96; respiration, 40.

At 1:53-15, dog 1, an injection of 22 minims of whisky was administered.

At 1:54, dog 2, an injection of 22 minims of whisky was administered.

At 1:55, dog 3, an injection of 22 minims of whisky was administered.

At 1:56, dog 1, blood-pressure, 115 mm.; stroke, 10 mm.; pulse, 160; respiration, 68. Dog 2, blood pressure, 70 mm.; stroke, 8 mm.; pulse, 156; respiration, 56. Dog 3, blood-pressure, 60 mm.; stroke, 10 mm.; pulse, 96; respiration, 40.

At 1:58, the sciatics were electrically stimulated. The results were not so marked as formerly.

At 2:05, dog 1, blood-pressure, 115 mm.; stroke, 10 mm.; pulse, 152; respiration, 68. Dog 2, blood-pressure, 75 mm.; stroke, 10 mm.; pulse, 142; respiration, 52. Dog 3, blood-pressure, 35 mm.; stroke, 18 mm.; pulse, 108; respiration, 36. Dog 1, an injection of 22 minims of whisky was given.

At 2:05-30, dog 2, an injection of 22 minims of whisky was given.

At 2:06-30, dog 3, an injection of 22 minims of whisky was given.

At 2:08, dog 1, blood-pressure, 118 mm.; pulse, 156; respiration, 56. Dog 2, blood-pressure, 78 mm.; stroke, 10 mm.; pulse, 152; respiration, 52. Dog 3, blood-pressure, 55 mm.; stroke, 16 mm.; pulse, 96; respiration, 36.

At 2:19, dog 1, blood-pressure, 11 mm.; stroke, 8 mm.; pulse, 160; respiration, 56. Dog 2, blood-pressure, 88 mm.; stroke, 19 mm.; pulse, 156; respiration, 44. Dog 3, blood-pressure, 55 mm.; stroke, 14 mm.; pulse, 100; respiration, 36.

At 2:19-30, dog 1, an injection of 22 minims of whisky was given.

At 2:20, dog 2, an injection of 22 minims of whisky was given.

At 2:21, dog 3, an injection of 22 minims of whisky was given.

At 2:22, dog 1, blood-pressure, 118 mm.; stroke, 10 mm.; pulse, 160; respiration, 72. Dog 2, blood-pressure, 84 mm.; stroke, 9 mm.; pulse, 148; respiration, 56. Dog 3, blood-pressure, 60 mm.; stroke, 16 mm.; pulse, 60; respiration, 36.

At 3:02, dog 1, blood-pressure, 100 mm.; stroke, 8 mm.; pulse, 60; respiration, 70. Dog 2, blood-pressure, 70 mm.; stroke, 8 mm.; pulse,

156; respiration, 52. Dog 3, blood-pressure, 55 mm.; stroke, 16 mm.; pulse, 56; respiration, 40.

At 3:55-15, an injection of 22 minims of whisky was administered to dogs 1, 2 and 3.

At 3:56, dog 1, blood-pressure, 115 mm.; stroke, 10 mm.; pulse, 160; respiration, 68. Dog 2, blood-pressure, 70 mm.; stroke, 8 mm.; pulse, 156; respiration, 56. Dog 3, blood-pressure, 60 mm.; stroke, 10 mm.; pulse, 56; respiration, 40.

At 3:58, electrical stimulation was applied to the sciatic nerve. Not so active a vasomotor mechanism was observed as in previous stimulations.

At 4:05, dog 1, blood-pressure, 115 mm.; stroke, 10 mm.; pulse, 152; respiration, 68. Dog, 2, blood-pressure, 75 mm.; stroke, 10 mm.; pulse, 142; respiration, 52. Dog 3, blood-pressure, 55 mm.; stroke, 18 mm.; pulse, 100; respiration, 36.

At 4:06, an injection of 22 minims of whisky was administered to dogs 1, 2 and 3.

At 4:08, dog 1, blood-pressure, 118 mm.; stroke, 11 mm.; pulse, 156; respiration, 56. Dog 2, blood-pressure, 78 mm.; stroke, 10 mm.; pulse, 152; respiration, 52. Dog 3, blood-pressure, 58 mm.; stroke, 9 mm.; pulse, 100; respiration, 36.

At 4:19, dog 1, blood-pressure, 111 mm.; stroke, 8 mm.; pulse, 160; respiration, 56. Dog 2, blood-pressure, 88 mm.; stroke, 9 mm.; pulse, 156; respiration 44. Dog 3, blood-pressure, 55 mm.; stroke, 14 mm.; pulse, 100; respiration, 36.

At 4:20 an injection of 22 minims of whisky was given to dogs 1, 2 and 3.

At 4:22, dog 1, blood-pressure, 118 mm.; stroke, 10 mm.; pulse, 160; respiration, 72. Dog 2, blood-pressure, 84 mm.; stroke, 9 mm.; pulse, 148; respiration, 56. Dog 3, blood-pressure, 55 mm.; stroke, 12 mm.; pulse, 132; respiration, 40.

At 4:48-15, dog 1, blood-pressure, 114, mm.; stroke, 8 mm.; pulse, 156; respiration, 64. Dog 3, blood-pressure, 60 mm.; stroke, 12 mm.; pulse, 128; respiration, 40.

At 4.49-45, an injection of 22 minims of whisky was administered to dogs 1, 2 and 3.

At 4:50-45, dog 1, blood-pressure, 121 mm.; stroke, 8 mm.; pulse 172; respiration, 68. Dog 2, blood-pressure, 75 mm.; stroke, 7 mm.; pulse, 144; respiration, 52. Dog 3, blood-pressure, 60 mm.; stroke, 11 mm.; pulse, 120; respiration, 44.

At 4:52, the sciatics were stimulated. The results were as in the last observation.

At 5:03, dog 1, blood-pressure, 120 mm.; stroke, 9 mm.; pulse, 144; respiration, 68. Dog 2, blood-pressure, 75 mm.; stroke, 9 mm.; pulse, 144, respiration, 52. Dog 3, blood-pressure, 62 mm.; stroke, 11 mm.; pulse, 120; respiration, 44.

At 5:04, an injection of 22 minims of whisky was administered to dogs 1, 2 and 3.

At 5:07, dog 1, blood-pressure, 130 mm.; stroke, 11 mm.; pulse, 168; respiration, 48. Dog 2, blood-pressure, 74 mm.; stroke, 8 mm.; pulse, 148; respiration, 48. Dog 3, blood-pressure, 65 mm.; stroke, 10 mm.; pulse, 96; respiration, 36.

At 5:26-30, dog 1, blood-pressure, 120 mm.; stroke, 8 mm.; pulse, 160; respiration, 66. Dog 2, blood-pressure, 80 mm.; stroke, 10 mm.; pulse, 152; respiration, 56. Dog 3, blood-pressure, 65 mm.; stroke, 8 mm.; pulse, 100; respiration, 40.

At 5:27-30, an injection of 22 minims of whisky was administered to dogs 1, 2 and 3.

At 5:30, dog 1, blood-pressure, 123 mm.; stroke, 10 mm.; pulse, 153; respiration, 72. Dog 2, blood-pressure, 74 mm.; stroke, 10 mm.; pulse, 132; respiration, 56. Dog 3, blood-pressure, 70 mm.; stroke, 8 mm.; pulse, 88; respiration, 40.

At 5:31, electrical stimulation was applied to the sciatics. The usual effect was noted.

At 5:35, the animals were killed with intravenous injections of MgSO.

Experiment. Nitroglycerin.—Small mongrel pup; weight, three kilos. Morphine and ether anesthesia. At 12:05, blood-pressure, 120 mm.; pulse, 210; respiration, 60.

At 12:06-30, an intravenous injection of 10 minims of a one per cent. solution of nitroglycerin was made. At 12:07, blood-pressure, 60 mm.; pulse, 192; respiration, 48. At 12:10, blood-pressure, 110 mm.; pulse, 210; respiration, 48. At 12:15, blood-pressure, 100 mm.; pulse, 180; respiration, 36. The animal was then killed.

MEDICAL PROGRESS.

SURGERY.

Experimental Surgery on the Vasa Deferentia.—Animal experiments for the purpose of determining the permeability of the canal when total or partial resection of the epididymis had been done, and the vas sutured either to the testicle or the resected epididymis, have been made by W. BOGOLJUBOFF (Archiv f. klin. Chir., Vol. 72, No. 3). He operated on various animals, horse, dogs, sheep and cats, and claims that, in several instances, the anastomosis formed between the vas and the epididymis permitted the passage of the spermatozoa. It seems that the most suitable locality for making the anastomosis is between the vas and the head or the upper half of the epididymis. In most cases an intermediate space is formed which includes at the ends the canals of both structures. The author suggests that the operation may be applied clinically in certain cases where inflammatory conditions of the epididymis have produced an azoospermia.

The After-effects of Head Injuries.—Mental disturbances which follow injuries to the head are by no means the only factors to be considered in these frequent traumata. There is a long list bearing upon the impairment of certain special intellectual faculties. T. CRISP ENGLISH (Lancet, Feb. 27, 1904) states that traumatic amnesia of some kinds is very common, varies greatly in degree and may be temporary or permanent. Agraphia as a consequence of cerebral injuries may persist indefinitely. It occurred in an officer who had been shot through the head in South Africa, in which, fifteen months after the injury, he was apparently absolutely well, with the exception of a total inability to write. The musical faculty is sometimes lost while others are retained. Some patients who are unable to speak a word can sing it. The arithmetical faculties may be lost; it having been recorded in numerous instances that clerks apparently perfectly well, had, after cerebral injury, been unable to add up a single column of figures. In the diagnosis of these various conditions, malingering and exaggeration must always be remem-

bered. Hysteria, neurasthenia, syphilis and gout should be carefully excluded. The conclusions as to treatment are as follows: (1) In rather more than half of the cases cure may be brought about by medical measures; prolonged mental rest and the proper administration of mercury are the essential points. (2) In a few of the cases the symptoms are mainly due to chronic osteosclerosis and such cases may be almost certainly cured by trephining. (3) In the remainder of the cases the symptoms are more persistent and do not yield to general measures or to the removal of thickened bone only. The author believes that in such cases these symptoms are the reflex results of lesions or irritations of the dura mater; and if the injury has involved the vault of the skull cure can be effected promptly by excision of the thickened or adherent dura mater and removal of any other source of irritation which may be present.

Otto Schmidt's Treatment of Cancer.—Ours is not the only public infested by the octopus called "quack." JOHN SHAW (Med. Press, March 16, 1904) states that while journeying in Switzerland, he took occasion to study, at one month's interval, the effect of this widely advertised treatment on some of his countrymen and women, who had been seduced into taking it. It is the same old story of injections, promised cures, sloughings, delays and ultimate recurrences. The author was unable to obtain any satisfaction from Dr. Schmidt, and when he remarked that a certain patient, who was about to be discharged "with the cancerous process arrested," be sent to Prof. Von Bergmann in order that his opinion as to the alleged arrest might be obtained, Schmidt replied: "Es hat keinen Zweck." In the opinion of the author, it is desirable that before any further exodus of English people takes place, to this sanitarium it should be further investigated.

Fecal Incontinence Treated by Injections of Paraffin.—Broadly speaking, these cases may be divided first, into those cases in which the sphincter ani still retains a small degree of power, and second, those in which it is absolutely paralyzed or is absent. For the latter class of cases, a number of plastic operations based upon the theory of muscle splitting, have been devised, the chief muscles concerned having been the levator ani and the gluteus maximus. A. H. BURGESS (Lancet, March 12, 1904) reports two cases of absolute incontinence, one of which was associated with rectal prolapse in which he has obtained great benefit from the submucous injection of paraffin. The injections were made under anesthesia and were placed in several tiers, the upper one commencing as high as the operator could reach. The bunches of paraffin were arranged in threes, so that they may be conceived to have a somewhat similar action to the rectal valves. The melting point in each case was 111° F. In one case 52 c.cm. of paraffin were introduced. This is approximately equal to an ounce and a half. The other patient was a boy who had suffered from complete incontinence of feces from infancy. He had had various operations performed without any improvement being manifest. Two injections were made, the first comprising 6 c.cm. and the second 27 c.cm. There were thus 33 c.cm. or about an ounce injected in all. The dangers of embolism from paraffin injection are well known, but if the material undergoes organization, as it is said to do, this is a danger which in such desperate cases may well be discounted.

Perforation in Typhoid.—The results of intervention in typhoid perforation have as yet not been crowned with the success which was originally hoped for. H. C. DRURY and WILLIAM TAYLOR (Med. Press, Jan. 13, 1904) report, however, a most encouraging case. It was that of a boy, twenty-one years old, who was suffering from ambulatory typhoid. The second day after admission to the hospital he complained of severe pain. Four hours later his pulse had risen to 120; face was drawn and anxious, the abdomen full and distended. It was tender and tympanitic. Eight hours from perforation with a pulse at 150 and respiration at over 50, the abdomen was opened. The perforation was easily found about 20 inches from the cecum. The opening was closed, together with a second ulcer, which seemed about to perforate. Several pints of warm salt solution were left in the cavity. Time of operation, twenty-one minutes. The heart flickered along at the rate of 150 for two days and gradually got down on the fourth day to 100. Unfortunately there was a local infection in the wound. Twenty-eight days after operation he complained of pain in the abdomen. The symptom persisted and grew worse, the patient became very sick, the temperature was normal, the pulse rose to 116. There was obviously obstruction. An enema produced no effect. The intestines were found extensively matted together, angulation being the cause of the obstruction. Unfortunately the case succumbed from the shock of this secondary operation. Autopsy showed an interesting condition, namely, that there were numerous ulcers which would not have healed for four or five weeks from the termination of the fever.

Radical Cure of Femoral Hernia.—Bottini, Bassini, Kocher, Cushing and others have perfected technics from the treatment of this condition, which in most cases may be depended upon to give permanent relief. J. H. NICOLL (Med. Press, Jan. 6, 1904) describes his operation, which is devised particularly for very bad cases, as follows: (*a*) Obliteration of the sac; expose it, open it, remove its contents, separate it for one inch around the abdominal part of the ring; bisect it longitudinally; make an aperture in one-half near the neck; interlock the halves by putting one-half through the opening in the other; reduce the sac which lies thus bunched up within the abdomen. (*b*) Closure of the femoral ring. Carry a bone-deep incision from the femoral vein along the pubic ramus to the pubic spine. Detach the periosteum and retract it. Drill the bone near its upper edge in two places. By a method which is described in admirable detail these drill holes are utilized as points of attachment for the fascia. The method is in a measure similar to that of Roux who drives a U-shaped staple through the ligament in the bone.

Ambulatory Treatment of Fracture of the Lower Extremity.—A great many continental surgeons pride themselves on being able to have their patients walking within a few days after the occurrence of the fracture. T. H. OPENSHAW (Lancet, March 12, 1904) describes Hoefftcke's modified Hessing's splint, which he has used with great satisfaction in a large number of cases. So widely is this instrument utilized in Europe that the designer, who was originally a carpenter, now has an immense plant and is a very wealthy man. It is used for fractures of the lower extremity and disease of the elbow, hip or knee. The splint case consists of four minor cases united by steel bands. Heavy leather encircles the thigh from just above the patella to the level of the ischiatic tuberosity behind. This leather opens in front, to be laced up when fitted on. It is fenestrated and lined with flannel. Along each side are clamped firm, adjustable, steel supports, which serve to transmit the weight of the body from the leather casing to the ground. The weight is carried in two ways. First, as above, through the tuberosity, and second through the very accurate fitting of the casing to the thigh. By this double action, the approximated ends of both are not allowed to override. A steel sole

piece with a strong upright on each side is directly continuous with the lateral thigh pieces. This splint is made as follows: A plaster cast is taken of the extremity. This is removed by a split down the outer side, then horizontally across the front of the ankle-joint. This mold is then used to make an ordinary plaster cast of the extremity, and on this cast the leather and casings are built. Most patients can walk with this apparatus without the aid of a stick at the end of a week. The advantages of the splint are obvious, patients who otherwise are obliged to stay in bed being able to go to business at the end of a week or ten days.

Alterations of the Gastro-intestinal Canal in Pernicious Anemia.—FABER and BLOCH reported in Gaz. degli Osped. (March 17, 1904): From an accurate study of the intestinal canal in three cases of pernicious anemia, new proof of the statements made in 1889 were found contradicting the view that those alterations described by Nothnagel and his school as intestinal atrophy should be considered post-mortem autodigestion. The authors injected formalin into the alimentary canal and peritoneum directly after death. The mucous membrane of the stomach and intestine was thus preserved. In each of the three cases was found a diffuse gastritis, in two cases the number of the glands was diminished. Some of the glands of the stomach showed a cystic dilatation, the rest nothing abnormal. The stroma was hyperplastic and irregularly infiltrated with round cells. Clinically achylia was found in all three cases. In the intestine no anatomical changes were found, and the minute glandular structure was absolutely normal. No atrophy was found. The authors believe that the gastritis had no etiological relation with the anemia, because cases of pernicious anemia had been observed without achylia, and innumerable cases of ordinary gastritis without anemia. Both the gastritis and the anemia may arise from the same toxic influence, and it is possible that the toxin originated in the intestine. This cannot be demonstrated anatomically.

New Treatment for Fracture of the Neck of the Femur.—The results which are obtained from the usual methods of treating this particular fracture are probably less satisfactory than those following fracture of any other bone in the body. One important reason for this is the mistaken idea which is very generally held by the medical profession that the fracture of the neck seldom occurs except in old people, and hence wrong methods of treatment are instituted from the beginning in young and vigorous individuals who are thus permanently condemned to more or less functional disability. Furthermore, in old people the results are at once recognized as being unsatisfactory and only partial resumption of the function of the joint is even hoped for. R. WHITMAN (Med. Rec., March 19, 1904) suggests a much more hopeful prognosis for the majority of cases when subjected to an early diagnosis and efficient treatment and points out the frequency with which this condition is met in young and middle aged people. The typical treatment for complete fracture of the neck is the long T-splint to which the body and limb are bandaged, supplemented by the traction force of a weight of from five to seven pounds attached to the foot to resist muscular spasm and to overcome eventually the shortening caused by the upward displacement. It is evident, however, that this method does not prevent more or less movement of the fragments and no attempt is made to secure an accurate apposition of them. In fact in most cases an early resumption of movement is advised in many instances to prevent the patient from becoming bedridden. An impacted or partial fracture is not generally made complete and reduced, although the patient must thus be condemned to partial disability because of direct interference with the function of the joint. Since the deformity which usually results is due to the overriding and adduction of the lower fragment it is urged that this may be most easily prevented by a gradual and forcible abduction of the limb until the trochanter presses upon the pelvis, and then using this as a fulcrum a further abduction will make the capsule tense and thus best direct the outer toward the inner fragment contained within the acetabulum and bring them into more or less accurate apposition. This having been done, a plaster jacket is applied from the mammary line of the chest down to the toes of the affected side, traction and abduction being maintained and care being taken that the jacket fits well around the hips. It is, of course, necessary to first apply cotton and bandages to protect the skin and preferably a jacket of seamless skirting may be used to cover the body and limb. In some cases it may not be necessary to carry the plaster cast below the knee or so high upon the chest. The long spica may be shortened at the end of four weeks, and probably removed at the end of eight. Massage and passive movements may then be used but the limb should not be allowed to support weight for at least four months. In any event, increased and especially persistent discomfort after functional use indicates that the joint is not equal to the work that is required of it and further rest should be demanded. This method should be used in old people as well as the young for the chances of complete recovery in these cases depends more upon complete immobilization and good apposition of the fragments, than upon the age of the patient. Furthermore, the patient may be moved and gotten up to walk with a short spica of the above description long before it would be justifiable with any other appliance, for the immobilization of the parts is more complete. The results from the above methods of treatment have been very successful and have been employed by the author during the past three years.

PHYSIOLOGY.

Effects of Sulphocyanides on Metabolism.—Even less than 0.25 gram of sulfocyanide will give a distinct reaction in the urine with chloride of iron, if given by mouth, according to A. MAYER (Deutsch. Arch. f. klin. Med., Vol. 79, Nos. 3 and 4). After three hours the reaction can no longer be obtained unless a second dose has been given. The total amount of sulphur excreted was high, but neither sulphuric acid nor ether-sulphuric acid was influenced. It seems that sulfocyanides share the properties of other cyanides in inhibiting to some extent the natural oxidation of proteids within the body. Observations on the acidity of urine, show that this is reduced while the amount of ammonia is increased. The excretion by way of the salivary glands is equally as slow as through the urine. Numerous blood-counts made before and after the administration of harmless doses gave no evidence of change.

Amount of Sulfocyanide Excreted in Health and Disease.—By means of a new, very delicate, quantitative method, A. MAYER (Deutsch. Arch. f. klin. Med., Vol. 79, Nos. 3 and 4) could prove that sulphocyanide is a constituent of every normal urine and that about 0.05 gm. are excreted in every liter. Smoking seems to increase the amount considerably, but probably only because so much more saliva is swallowed. High figures were obtained after exercise and low ones after excessive perspiration, but in no case examined was this substance absent altogether. In disease, the daily amount stands in relation to the amount of urine voided and all febrile conditions are accompanied by an increased discharge. In general, the author obtained the impression that the saliva is not the only source, but

that sulphocyanides are formed in other as yet unknown parts of the body.

Researches in the Pancreatic Juice.—The quantity of pancreatic juice daily secreted, according to K. GLAESSNER (Hoppe-Seyler's Zeitsch., Jan. 26, 1904), is about 500 to 800 c.cm. It contains no trypsin, but only a forerunner of the same, which is rendered active by means of the intestinal juice. The fat-splitting and diastatic ferments are strengthened by means of the bile and intestinal juice or only by the latter. The hydrolysis of starch proceeds only as far as maltose, the further splitting of the disaccharides being brought about by means of the intestinal juice. Disaccharides (milk and cane-sugar) are not influenced by the pancreatic secretion. The quantity of juice ferment and the degree of alkalinity are smallest during the condition of fasting, rise soon after a meal, reach their highest point four hours later, to sink eight hours after the beginning of digestion.

The Influence of Various Salts on Pancreatic Digestion.—The alkali salts of the halogens, according to H. R. WEIS (Hoppe-Seyler's Zeitsch., Jan. 26, 1904) disturb tryptic digestion to a very small degree, sodium chloride most of all, potassium chloride less and this latter more than the corresponding iodine and bromine compounds of the same concentration. Sodium oxalate has a much more powerfully inhibitory effect than sodium chloride. The sulphates have a greater inhibitory action than the chlorides. Borax has no effect, and the acid sodium phosphate has a favorable action.

Remarks upon Temperature.—The general opinion has always been that temperature is one of the most invariable factors to be observed in the human body, but since the nursing of surgical cases, in particular fractures and other local injuries, has been brought to bear so fully upon numerous cases, it has been observed that under physiological conditions there may be an appreciable degree of variation. M. S. PEMBREY (Brit. Med. Jour., Feb. 27, 1904) states that the Darwinian theory leads to the conclusion that the warm-blooded have been evolved from the cold-blooded animals. The temperature of newly born pups, kittens and rabbits falls when they are removed from the warm surroundings of their mother until it reaches but a few degrees above the surrounding air. This, however, is not true of newly born guinea-pigs who incidentally have their eyes open, are thickly coated with fur and are early able to take care of themselves. The young warm-blooded animals may therefore be divided into two classes, those which are blind and helpless and naked and those which are the opposite. These observations were made by Edwards in 1824, but it has only recently been shown that the difference lies in the development of the power of thermogenetic regulation. So far as infants go, Raudnitz has investigated with the view of determining in which class they belong. The conclusions of numerous observations show that the power of regulating temperature is incompletely developed in the newly born infant. The regulation of heat loss is imperfect as well as the regulation of heat production. Maternal instinct has evidently long since anticipated what science has but recently observed, and it is a corollary that the higher and finer the degree of maternal instinct, the less the power of the young to regulate their temperature. The range of temperature in the healthy adult should be determined by rectal temperature alone, the mouth being decidedly irregular. Healthy man shows a range of from 98.8° to 100° F. Certain individuals have been shown to be capable of maintaining a temperature of 101.3° F. without its causing distress. It is important to note that these physiological relations are prone to take place in domestic animals, a fact that should not be forgotten in the exhibition of tuberculin and other tests. Muscular work is considered by the author to be in a measure responsible for heat stroke. It is highly probable that time will show that numerous patients are now kept in bed to be enfeebled thereby simply because their normal temperature is above 98.6° F. The influence of changes in external temperature has probably been correctly interpreted, for it has been truly shown that the yearly average temperature of a man living in the Tropics and the arctic regions is the same. The anesthetized patient cannot regulate his temperature. The combustion of the body is reduced to one-half its normal value and the vital resistance concomitantly decreased. The limits of body temperature compatible with life apparently lie between 75.2° and 114.8° F.

Secretion and Blood-flow of Pancreas.—The fact that secretion continues for some time after complete cessation of the pancreatic circulation, leads O. MAY (Jour. of Physiol., Feb. 25, 1904) to conclude that there is no direct relationship between the rate of secretion of pancreatic juice and the extent of its blood-supply. By means of the plethysmographic method the author found a suitable means of recording the changes in the blood-supply of the pancreas. This organ is well supplied with vasoconstrictor nerves. The secretion resulting from the intravenous injection of secretin is accompanied by well-marked vasodilatation of the pancreas, which dilatation appears to be secondary to the secretion, probably a result of the action of some catabolites on the vessels.

Investigations on the Liver.—The observation of, diagnosis and treatment of diseases of the liver reveal the utter paucity of the knowledge of the normal and pathological functions of this organ. The researches of L. BRAUER (Hoppe-Seyler's Zeitsch., Dec. 19, 1903) seek to broaden the horizon of the knowledge of this subject. It is noted that while normal human bile contains mucin or nucleo-albumin, it contains no coagulable proteid. Traces of the last are found as a cadaveric manifestation and in catarrh of the biliary passages. Larger quantities are present in hepatic congestion, typhoid and parenchymatous nephritis. It has also been discovered in fatty and cirrhotic liver, but not in amyloid or carcinoma. "Albuminocholia" connotes this condition. Normally in the intestine the bile is partly absorbed, nearly all of its water and a large part of its acids. The latter are carried again to the liver where they stimulate a further secretion of bile. For this reason the bile obtained by means of an artificial or natural biliary fistula is not quantitatively identical with that produced under the influence of the normal circulation of the biliary acids. Without the normal stimulus of the latter upon the hepatic function the quantity and quality of the bile are materially lessened. This peculiar circulation of the important constituents of the bile led the author to investigate whether drugs administered for their effect upon the liver undergo a similar circulation. This is found to be the case with methylene blue, which is interesting in this connection, inasmuch as it is one of those drugs that have been administered with the view of controlling infectious catarrhal processes in the biliary passages, particularly those that result in the formation of calculi. Indeed, it has been found that under the influence of methylene blue, cholecystitic manifestations recede and there is a corresponding diminution of coagulable proteid in the bile. The excretion of methylene blue in the bile exceeds the excretion of this substance in the urine during the first few hours after its administration. These facts are of extreme interest for the light which they throw upon the etiology of diffuse diseases of the liver. They tend to

support the hypothesis that hepatic cirrhosis, as for example, in chronic dyspepsia, may depend upon the absorption from the intestine of toxins, which undergoing an intermediate circulation like that of the biliary acids and methylene blue, act upon the liver more profoundly than upon any other organ such as the kidney, which, although it in the long run excretes these toxic products, at any rate does not suffer from the repeated circulation of these substances through its parenchyma. It is well known that methylene blue is excreted by the kidneys partly in the form of reduction products known as "leucobodies." This is also true of the methylene blue excreted in the bile. This fact is of importance from the standpoint of hepatic antisepsis, inasmuch as these leucobodies in themselves are non-toxic. Under normal conditions human and animal bile contain no sugar. During the first few days of pancreas-diabetes sugar appears in the bile. Naunyn found the condition of glycocholia in the diabetes produced by puncture of the floor of the fourth ventricle. The author found that ethyl- and particularly amyl-alcohol easily pass into the bile. Moreover, alcohol shows a greater preference for the bile than for the urine. These facts coincide with the clinical experience that chronic alcoholics suffer more frequently from hepatic than from renal diseases. The anatomic interpolation of the liver in the portal circulation would naturally expose this organ to the influence of toxic agents administered per os more than any other gland. The results of the author not only indicate the easy passage of alcohol through the liver, but also the fact of greater importance, namely, the irritation of the hepatic parenchyma resulting from this passage. Always after relatively large doses of alcohol taken on an empty stomach, coagulable albumin appears in the bile, more in the case of amyl- than in the case of methyl-alcohol. In this instance there is a more marked tendency to the appearance of albumin in the bile than in the urine. Cirrhosis of the liver, which is considered as a typical drunkard's disease, has never been experimentally produced. That it results from the irritation of the alcohol is indicated by the experiments of the author, for just as albuminuria indicates a damage to the parenchyma of the kidney, so albuminocholia indicates a lesion of the parenchyma of the liver. The frequent occurrence of acute hepatitis after the generous imbibition of alcohol is also easily explained by these experiments. Moreover, under the influence of alcoholic intoxication there appear in the bile isolated epithelial casts of the fine interlobular biliary passages, as well as a form of hyaline casts. In normal animals these are not found. The casts are evidence of an ascending catarrhal cholangitis, the result of an intoxication. The casts are produced either by a direct injury of the biliary passages by means of secretory phenomena in the latter, or by the stimulation of the interlobular bile ducts by the alcohol flowing by in the bile. Cylindroid casts have been found in the gall-bladder in cases of typhoid and cholera, as well as in hypertrophic cirrhosis and in the large clinical group of cases of icterus presenting toxic and infectious manifestations. Hanot's cirrhosis has been attributed to a catarrh of the bile ducts, and the known forms of icterus to an obstruction of the interlobular bile-ducts with liver cells, epithelia of the biliary passages and detritus.

NEUROLOGY AND PSYCHIATRY.

Surgical Treatment of Epilepsy.—The unsatisfactory results in the treatment of epilepsy by means of the bromides has led to various more or less hazardous surgical procedures with the aim that the irritative cause of the explosion might be removed. Some two hundred cases have been reported in which a bilateral excision of the superior and middle cervical sympathetic ganglia was done. S. D. HOPKINS (N. Y. Med. Jour., March 5, 1904) reports five more cases, one of which was particularly severe but has, since the operation, remained free from convulsions for a period of over two years and hence is considered a cure. The other four cases have been greatly improved, one of them having been without an attack for the past six months. All of them had been previously treated with the bromides without benefit. The removal of the ganglia is followed by several notable disturbances. In three of the cases the pupils remained contracted and acted sluggishly to the light. In the other two cases, one pupil was dilated while the other was contracted. All cases showed a congestion of the conjunctivæ and face, ptosis, increased flow of nasal mucus and a decrease in the pulse and respiratory movements, a decrease in the former of five to thirty beats being noted when the ganglia were divided. The function of the cervical sympathetic is to control the muscular action of the cerebral blood vessels, to transmit impulses from the stomach, intestines and lungs, and to enervate the dilator muscles of the pupil. The most probable theory of epilepsy is that there is a circulatory disturbance in the brain, and since the cervical sympathetic ganglia contain the vasoconstrictor nerves, the excision of these structures will prevent spasms of the blood vessels. A permanent dilatation thus increases nutrition and assists the removal of toxic substances. The excision of these ganglia also prevents the transmission of impulses from the viscera and is, therefore, necessarily of value in reflex epilepsy.

Motor Symptoms of Mania and Melancholia.—Any theory of the origin of these conditions and of the origin of delusions arising in patients suffering from them is welcome. W. H. B. STODDART (Lancet, March 5, 1904) states that he observed some years ago that melancholiacs suffer from paralysis and rigidity of the muscles of the spinal column and of the large proximal joints, the movements of the wrists and smaller joints being comparatively unimpaired. The attitude of the melancholiac is one of general flexion and adduction, the shoulders being raised owing to the rigid retraction of the upper part of the trapezius. In a severe case the patient cannot raise the elbows above the level of the shoulders, and in profound melancholiac stupor, he stands in the attitude of general flexion with adduction. If, however, there is associated some degree of restlessness, this naturally shows itself in those movements which are least paralyzed, viz., at the wrists, fingers, ankles and toes. For this reason, the melancholiac usually stands, rigidity of the hips rendering sitting uncomfortable. The movements of mania contrast very strikingly with those of melancholia. A maniac in a state of motor excitement moves, for the most part, from the large proximal joints. When a maniacal woman runs, there is an exaggerated movement at the hips, whereas in the running of a sane woman, there is almost none. When a maniac moves his arms, the greatest movement takes place at the shoulders, there being little or none at the wrists and fingers. The maniac shakes hands from the shoulder, the melancholiac from the wrist. In the maniac the attitude of prayer is with hands upraised, in the melancholiac the hands are clasped before the sternum. Experimental psychology has shown a most interesting relation of a normal individual to these phenomena. If such a person's arm is allowed to play upon an automatoscope, and the mind allowed to be absolutely indifferent, the instrument records a slight normal tremor. If now the patient be given an unpleasant stimulus such as the smell of asafetida, *adduction* of the arm is recorded. If, on the other hand, the stimulus is pleasant, viz., heliotrope, *abduction* of the arm is shown by the in-

strument. The author goes on to weave an interesting theory as to the origin of the delusions, which is based upon the belief that they take their rise directly from the disabilities produced by muscular spasms and paralysis. Thus the delusions of the melancholiac are to be traced from his general feeling of inactivity. The exaltation of the maniac arises in a corresponding way from the feeling of activity produced by the stimulation of his cortical neurons. He feels strong and capable of the most wonderful feats. This gives him the idea of power, and the delusion that he is the king or God.

A Salt Solution in Locomotor Ataxia.—The injection of a mixture of 250 c.c. $\frac{m}{8}$ sodium chloride, 125 c.c. $\frac{m}{8}$ sodium sulphate, 120 c.c. $\frac{m}{12}$ sodium citrate and 5 c.c. $\frac{m}{8}$ calcium chloride into the subcutaneous tissues of a man suffering from tabes, causes, according to S. A. MATTHEWS and O. A. BROWN (Am. Jour. Physiol., April 1, 1904), pains and other sensations similar to those experienced in the earlier stages of the disease. This occurs even though it has been years since such pains were first felt. The pains decrease successively after each injection, until about the fourth or fifth, after which they may not occur at all. The author cannot state whether such injections have any therapeutic value, though the effects of the latter are of physiological interest. It is possible that the remarkable localization reaction may be of diagnostic value. Injections into persons who did not have locomotor ataxia do not produce similar sensations.

Cerebrospinal Influenza.—Influenza is a chameleon-like clinical entity, says WELJAM OWITSCH (Med. Obosrenije, No. 22), which offers great difficulty to the clinical experimenter, and is with great difficulty distinguished from typhoid or malaria. Each epidemic shows great variation of the individual characteristics of the virus of influenza. The effect of the poisoning depends on the individuality of the patient. Every patient possesses a locus minoris resistentiæ, and, for example, in phthisical patients the lungs are especially liable to attack. In neurotic patients the cerebrospinal symptoms are easily developed. Delirium and alteration of consciousness are the results of a toxemia affecting the centers in the brain. A characteristic of influenza is a slowing of the pulse (toxic effect on the vagus), and slightly increased temperature. The purely nervous forms of influenza are not often mentioned in literature. Weljanowitsch records the history of a soldier in good condition, with a urethritis, who developed weakness, vertigo, loss of appetite, and suddenly had convulsions, with sudden loss of consciousness. Later, delirium developed. In this case a central irritation from the urethritis, or an embolism of the cerebral arteries, a uremia, or an intoxication following an infectious disease. The author diagnosed the case as influenza. Weljanowitsch came to the conclusion that the cerebral symptoms and cardiac symptoms are frequent in influenza. He advises digitalis, caffeine, strychnine or strophanthus as curative agents.

Cardiac Paralysis in Toxemia.—Beriberi has, like diphtheria, a special influence of a degenerative nature on the cardiac muscle, according to STANLEY (Gazz. degli Osped., March 5, 1904), and may produce cardiac paralysis. Such states of toxemia act in the same manner as poisoning by arsenic, alcohol, or by typhoid fever, rheumatism or influenza, all of which may produce a neuritis. The degeneration of the myocardium in beriberi or diphtheria is not due to a neuritis of the vagus, but is due directly to the influence of the toxin on the cardiac muscle. The cardiac paralysis never appears suddenly as a fully developed lesion, but is developed gradually, following cardiac weakness, increasing gradually in consequence of a degeneration of the myocardium. The fact that in beriberi cardiac paralysis appears with the same frequency as in diphtheria ought to make the prognosis of both diseases serious. Stanley, in the British Medical Journal, reports that in 500 cases of diphtheria observed by him, 30 died as a result of cardiac paralysis; 446 cases showed a change of the pulse. Of 341 cases of beriberi, 31 died of cardiac paralysis, 254 showed a diminution in the tension of the pulse, from which one may conclude a degenerative change in the myocardium.

The Source of Tonic and Clonic Epileptiform Convulsions.—According to different experimenters the convulsion center is spinomedullary, medullary, basilocortical or cortical, and insufficient distinction has been made between tonic and clonic spasm. So NINO SAMAJA (Revue Méd. de la Suisse Romande, March 20, 1904) instituted an extensive series of experiments on green frogs, rabbits, and new-born and adult guinea-pigs, cats and dogs. In each case the intact and healthy animal was subjected to the alternating street current for one second, and again after various curettings or sections of the central nervous system. The electrodes were placed in the different apertures or regions of the body according to circumstances, as, head, mouth, anus, etc. The author reaches conclusions as follows, with the understanding that the word "center" is used to designate that part of the cerebrospinal axis, whose stimulation excites tonic or clonic contractions: (1) The cortical motor area is the exclusive center in the adult dog and cat; the rest of the cerebrospinal axis gives only tonic convulsions. In the frog, the new-born dog and cat, the rabbit and the guinea-pig, the motor cortex, is not the seat of a convulsive center. (2) In the guinea-pig and the rabbit the medulla or the cerebral isthmus are the sources of clonic convulsions; in the guinea-pig and the frog the bulb isolated from the isthmus. (3) In all the mammals the spinal cord is the exclusive center for tonic contractions; it never gives rise to clonic spasm. In the frog, however, the cord is a clonic center. Thus, we find that the clonic convulsive center rises progressively from the cord to the cerebral cortex with the rise from the lower to the higher animals. It is situated in spinal cord and medulla in the green frog, in medulla in the guinea-pig, at the base of the brain in the rabbit, and in adult cats and dogs it is in the cerebral cortex. In man the seat of tonic convulsions is exclusively basilar, while that of clonic convulsions is cortical, and even at birth the motor cortical area is excitable. The type of clonic convulsions in man is partial Jacksonian epilepsy.

Hysterical Skin Symptoms and Eruptions.—The importance of recognizing these peculiar and interesting conditions cannot be overestimated. THOMAS D. SAVILL (Lancet, Jan. 30, 1904) has met with seven different kinds of hysterical skin symptoms: (1) Attacks of generalized pallor of the surface; (2) attacks of flushing; (3) fugitive localized patches of congestion suddenly appearing and disappearing; (4) dermatographia; (5) acroparesthesia and erythromelalgia; (6) urticarial and other hemorrhagic exudations; (7) localized ischemia. The first three are quite peculiar to the emotional vasomotor neurosis which we call hysteria. The remaining four are more frequently met with in so-called hysterical subjects than in others. The author cites a large number of cases which had come under his observation, presenting the greatest variety imaginable of apparently inexplicable symptoms. It is true today, he says, as it was in 1682, when Sydenham wrote: "Whatever part of the body it (hysteria) attacks, it will create the proper symptom of that part. Few of the maladies of miserable mortality are not imitated by it."

The Medical News.

A WEEKLY JOURNAL

OF MEDICAL SCIENCE.

COMMUNICATIONS in the form of Scientific Articles, Clinical Memoranda, Correspondence or News Items of interest to the profession are invited from all parts of the world. Reprints to the number of 250 of original articles contributed exclusively to the MEDICAL NEWS will be furnished without charge if the request therefor accompanies the manuscript. When necessary to elucidate the text illustrations will be engraved from drawings or photographs furnished by the author. Manuscript should be typewritten.

SMITH ELY JELLIFFE, A.M., M.D., Ph.D., Editor,
No. 111 FIFTH AVENUE, NEW YORK.

Subscription Price, including postage in U. S. and Canada.

PER ANNUM IN ADVANCE	$4.00
SINGLE COPIES	.10
WITH THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, PER ANNUM	8.00

Subscriptions may begin at any date. The safest mode of remittance is by bank check or postal money order, drawn to the order of the undersigned. When neither is accessible, remittances may be made, at the risk of the publishers, by forwarding in *registered* letters.

LEA BROTHERS & CO.,
No. 111 FIFTH AVENUE (corner of 18th St.), NEW YORK.

SATURDAY, MAY 7, 1904.

THE NEW BELLEVUE.

IN connection with the presentation of plans for the new Bellevue Hospital, we give this week a short sketch of the history of old Bellevue. It may well be called old Bellevue, since the main building with its wings dates practically entirely from the beginning of the nineteenth century, having been finished in the second decade. The never-ending wonder is that so much reasonably good work has been accomplished at Bellevue in recent years, notwithstanding all the drawbacks presented by the time-worn old structure and the amount of infectious material of various kinds that it has necessarily gathered, some of which has so soaked in that it will be impossible ever to remedy the evils it is sure to produce. In this age of hospital progress Bellevue has been a crying shame for the city of New York for nearly a quarter of a century, and no American medical man has ever thought of bringing a foreign member of the medical profession to visit it without profuse apologies for the conditions there.

Its existence in its present shape is all the more to be deprecated, since the advance in the building and equipment of hospitals throughout Europe, which is popularly supposed to be so effete and backward, has been so striking in recent years. One of the most interesting features of Moscow, and one that surely aroused the admiration and the envy of the members of the American medical profession who visited that city on the occasion of the International Medical Congress some six years ago, was undoubtedly its magnificent set of hospitals. Out in the university quarter, in what is known as the "Fields of the Virgins," because it formerly belonged to a Russian religious order of women, there are a number of handsome buildings, each housing a separate department of medical or surgical practice. Gynecology and obstetrics have their building, medicine and surgery each a building, nervous diseases a special building, ophthalmology a building. All of them are comparatively new, all built within the last fifteen years, handsomely fitted up, thoroughly modern in their appointments and all of them are fittingly maintained. Yet this is the land where the poor are supposed to be least the subject of consideration, where the Russian peasant, if we would believe ordinary tradition, is still scarcely better than a slave and where modern progress has had least effect upon the life of the people.

Republics are said to be ungrateful, which may be true, for one thing is sure that the only city in Europe which has old hospitals to compare at all with Bellevue is Paris, though it must be recalled that the French capital has also some new handsome city hospitals. Those who have visited Rome in late years will remember the magnificent new hospital only recently completed, situated not far from the railroad depot in one of the most salubrious parts of the city. In Vienna we are prone to think of the General Hospital as typical of the city, but it must not be forgotten that while the old Krankenhaus has been left almost in its original condition, there are at least three magnificent new hospitals in Vienna that will compare favorably with such institutions anywhere in the world. As for Berlin, under the leadership of Virchow, who considered that he could do nothing that would be more worthy of his fame, of his great scientific knowledge and of the interest he had taken in the poor, since the days when, as the result of his investigation into the famine conditions in Silesia, he became a Socialist and suffered for his views, the capital of Germany has secured for itself the finest set of hospitals in the world. Some ten years ago a resolution was passed appropriating during the course of the following fifteen years, about five million dollars to be spent in the erection of suitable hospitals for the city's sick poor. As the

result of that there have come the model hospitals of the world in many respects, and the great German people have shown that their practical genius is ready to apply itself not only to the problems of industrial development but also of care for their ailing poor.

In a word, New York, the metropolis of the great Western Republic, has in the matter of public hospitals, stayed far behind all the rest of the world. We have, in private hospitals, some that we may well be proud of and in which indeed foreign medical, and especially surgical, visitors find many suggestions for their work at home. Why the great city of New York itself should be behind private charitable corporations in this matter of appropriate provision for its sick poor, must remain a mystery. It is to be hoped that now at last the disgrace is to be wiped out and New York is to show that she is ready to do what is after all only her plain duty in the matter of taking care of the poor who have no other recourse except public charity.

At the present time the conditions for the development of a new Bellevue are more favorable, we venture to say, than they have ever been before. Under the management of the Board of Trustees, as constituted by the amendment of the Greater City charter, which became effective in 1901, Bellevue and the associated city hospitals have been so well conducted, considering the many handicaps under which they labor, as to be a source of admiration and encouragement for all who are interested in the care of the ailing poor. The energetic enthusiasm of Dr. Brannan, the president of the Board of Trustees, has shown itself especially capable of arousing the cooperation of all those connected with the city hospital work. It was to be expected that Dr. Brannan would evolve some such worthy plan for the renewal of Bellevue as is now proposed. It will certainly be too bad if New York City should refuse to accept the opportunity to do itself justice that is thus provided for it.

When millions of money are being spent on libraries, museums and various other public buildings, it would be discouraging to think that only the sick poor, those who can help themselves least, are to remain the subject of the unfortunate conditions that have existed in the past and still remain. Medical men have laid down their lives and are laying down their lives even in our own time, in the care of the city's poor. Present conditions increase their dangers. This is unworthy of what we hope is to be the greatest city of the twentieth century and the beginning of the correction of this state of affairs should come at once. Let us have a fitting replacement of Bellevue, according to the plans of the present Board of Trustees and then New York will live up to her past and nobly redeem her fair fame for the care of the poor.

SERUM TREATMENT OF TUBERCULOSIS.

As is well known, the treatment of tuberculosis in the human being by active immunization with the intracellular toxins of the tubercle bacillus, obtained from human tuberculous material, has not yielded very encouraging results. Attempts have accordingly been made to reach the desired end in other ways.

Especially noteworthy in this respect are the experiments of Maragliano, who apparently succeeded in obtaining a tuberculo-antitoxin in a manner quite analogous to the production of diphtheria antitoxin, viz., by immunizing animals with aqueous extracts of tubercle bacilli, which had been prepared at different temperatures. To judge from the available data, however, the resulting product is not sufficiently active as to warrant its more extended application. Marmorek's experiments in the same direction, in which the bacilli were grown on leucolytic sera with the idea of stimulating their production of toxins have similarly not led to a satisfactory issue.

More encouraging are the results which have been obtained by active immunization with tubercle bacilli of diminished virulence, in other words, by vaccination. Koch and Schütz, it will be recalled, have claimed that the bovine tubercle bacilli are not identical with the type found in man, and that it is not possible to produce tuberculosis in cattle by the injection of the human variety. This has proven erroneous, however, and it is now well established that heterologous infection is after all possible. The two types only differ in their degree of virulence, in so far as each has lost its infectiousness to a certain extent for the heterologous host. With this basis given it appeared quite likely that it would be possible to actively immunize cattle against tuberculosis by means of human tubercle bacilli. Extensive investigations in this direction by von Behring have fully borne out the correctness of this surmise, for he succeeded in almost completely protecting animals in this manner against subsequent infection with virulent bovine bacilli. As Ehrlich and Brieger had shown in corresponding experiments that tetano-antitoxin appears in the milk,

it seemed quite logical to infer that it would be possible to produce a passive immunity against human tuberculosis by feeding infants with milk from cows that had previously been actively immunized in the manner indicated. It appears, however, that a prophylactic treatment of this character is not possible, as the serum of the immunized cattle does not contain any specific antitoxic or bactericidal antibodies, which could pass into the milk. While a material advance in this direction is accordingly not to be anticipated, the question naturally suggests itself whether it would not be possible to protect the human being by prophylactic injections with bovine tubercle bacilli. The possibility certainly is there, but under existing conditions it scarcely seems justifiable to make the necessary experiments. While this line of advance is thus closed there are still other paths along which the problem can be attacked.

Especially interesting in this connection are the experiments of Möller, who found that it is possible to accustom tubercle bacilli to a lower temperature than that of the human body. By experimental production of tuberculosis in blindworms he thus obtained a culture which only grew between 20° and 25° C. and died at a higher temperature. This growth proved entirely avirulent for warm-blooded animals, but was capable of producing prophylactic immunity against subsequent infection with virulent tubercle bacilli, as Möller proved in his own person. A curative effect upon animals, however, which had previously been infected could not be demonstrated.

A further advance has recently been reported by Pröscher from Pappenheim's laboratory. He suggests the necessity of simultaneous active and passive immunization of the already infected organism with antitoxin serum and toxin (antituberculin and tuberculin). The object of the antitoxin treatment is the neutralization of the tuberculotoxin, bearing in mind that an immunizing effect is obtained nevertheless even though the toxin solution has been completely neutralized by antitoxin.

Pröscher's procedure is the following: Starting with blindworm tuberculotoxin, which is isolated according to a special method, he produces an antitoxin serum of high potency by active immunization of appropriate animals. Guinea-pigs, which have previously been inoculated with human tubercle bacilli are injected subcutaneously with the resulting serum, and at the same time intravenously with the blindworm tuberculotoxin. This is then repeated with increasing doses according to the condition of the animal, either daily or every other day. Pröscher regards his results as quite encouraging and believes that he will shortly be in a position to obtain an antiserum which will meet all the demands that can be made of such a product in the attempt to successfully combat human tuberculosis. Further details of the experiments which are now in progress in Pappenheim's laboratory will be anticipated with much interest.

A NEW OUTLOOK IN THERAPEUTICS.

THE recognition of the protozoan genus, *Trypanosoma*, as the chief etiological factor in the production of several tropical diseases, including the affection commonly known as "sleeping sickness," lends general interest to the methods proposed for attacking these parasites.

At the recent meeting of the American Association of Pathologists and Bacteriologists, Prof. Ehrlich, of Frankfort, reported the results of his experiments with a compound which possessed specific action upon one of the members of this group. A more complete account of his labors in this field, which were carried on in collaboration with Shiga, has been recently published (*Berliner klinische Wochenschrift*, 1904, Nos. 14 and 15), from which a number of suggestions may be gathered.

Although it seems reasonable to make use of the immunizing agency of specific antitoxins, the success of certain pharmacological products, such as quinine in malaria, lends support to the suggestion that chemical agencies may be made equally efficient. Their production and application is usually more simple than those derived from bacterial sources, especially when the higher protozoan organisms are under consideration. Laveran and Mesnil have had more or less success in their experiments with arsenate of soda in certain tropical animal diseases caused by the *Trypanosomata*, the unfavorable results being due to the chronic arsenical poisoning which appeared.

Ehrlich and Shiga made use of stains derived from the benzo-purpurin series and succeeded with a combination which they have called "trypanroth" (trypanred). They found that by the injection of a one per cent. solution of this substance in mice, a diffuse coloring of the skin and internal organs took place which lasted from six to ten weeks. They were next able to prove that mice injected with the coloring matter and blood

containing the trypanosomes, did not become diseased.

Similarly favorable results were secured when the solution was injected three days after the infection had taken place and the animal's blood was laden with the parasites. Recurrences were noted but they did not occur until after a considerable period (sixty-five days). An interesting fact is that the same good effects were noted when the substance was given by mouth. Mice that were fed with the drug for some days were able to stave off the infection entirely or were but slightly affected. The question as to whether the same good effects are seen in other animal species, has not been fully answered by the experiments thus far undertaken.

The authors believe, however, that closely related chemical products will be found to overcome the somewhat more unfavorable results seen in the other animal species experimented upon. It is of importance to know by what means these stains accomplish their purpose. Ordinary germicidal properties cannot be assigned to them as it was found that the trypanosomes were only destroyed within the animal body under conditions which could not be reproduced outside of the latter.

Further experiments also, showed that the protection called forth by the presence of the drug in the body only lasted a few days, but it was also demonstrated that a certain degree of immunity was conferred in those animals which had been infected and subsequently cured. The immunity, however, was limited, as shown in those cases where recurrences took place in sixty-five days.

Aside from the possibilities of their practical application, these observations are of interest in other ways. They apparently throw some light on the question of the manner of the recurrences in other diseases, such as malaria and syphilis. For these diseases it may also be assumed that the appearance of a recurrence may be ascribed to a transitory and more or less rapidly declining immunity and the effectiveness of a certain number of residual germs. It ought not to be a difficult matter to prove this experimentally in the case of malaria, by attempting to reinfect the individual after a cure had been accomplished by means of quinine. The time which elapsed before reinfection took place would then correspond to the immunity conferred by the quinine.

Another important result gained by these observations is, that they point to some bond of connection between immunity and cure produced by pharmacotherapeutic agencies. For it was shown that the trypanred which is analogous to other better known drugs, gave rise to conditions which led to an active immunity. Immunity secured in this way may possibly be more effective than that produced by specific sera, for during the activity of the latter, part of the receptor apparatus of the parasite is taken up which is consequently rendered inactive in so far as the actual production of antibodies is concerned. The possibilities offered by this new field of research are of far-reaching interest and importance.

ECHOES AND NEWS.

NEW YORK.

Measles Prevalent.—Measles is spreading at an alarming rate, according to Health Department figures, and its prevalence is declared to be greater than was ever known before. In many cases, too, it is followed by bronchopneumonia. Last week's report showed 1,630 cases in the five boroughs, with 37 deaths from measles and 135 from bronchopneumonia. Since Jan. 30, when there were 814 cases, the increase has been steady.

New York School of Clinical Medicine.—At the meeting of the Medical Board of the New York School of Clinical Medicine held April 9, Dr. J. L. Adams was elected Secretary of the school and professorial and other distinctions were conferred upon the following in the departments specified: Mental Diseases: Prof. E. C. Dent, Superintendent, Manhattan State Hospital, West, Ward's Island. Internal Medicine: Prof. Wm. Brewster Clark, M.D.; Gastro-intestinal Diseases: Prof. Robert Coleman Kemp, M.D., Associate Prof. Graham Rogers, M.D.; Hydrotherapeutics: Prof. Alfred W. Gardner, M.D.; Ophthalmology and Otology: Prof. Geo. Ash Taylor, M.D.; Clinical Instructor and Assistant, Wm. E. West, M.D.; Genito-urinary Diseases: Chief of Clinic and Associate, Prof. C. Stern, M.D.; Dermatology: Chief of Clinic and Instructor, L. D. Weiss, M.D.

State Civil Service Examinations.—The State Civil Service Commission announces general examinations on May 21 for the following positions: Apothecaries in State hospitals and institutions; resident physician and superintendent of nurses at the State Hospital for Tuberculosis; physicians in State hospitals and institutions of both regular and homeopathic schools. Address Chief Examiner at Albany.

Gift to Post-Graduate Hospital.—New York Lodge of the Benevolent and Protective Order of Elks held, on May 5, a ladies' social session in their Lodge rooms at Elks' Hall, Fifty-eighth Street and Eighth Avenue, and dedicated two beds which are to be endowed in the Post-Graduate Hospital. The contract was signed, and there were appropriate ceremonies. Mr. Champe M. Andrews made an address on behalf of the Lodge; Dr. D. B. St. John Roosa spoke on behalf of the Post-Graduate Hospital, and John J. Delany, corporation counsel, spoke of the charities of the city.

New Fordham Hospital.—Plans for the group of new Fordham Hospital buildings to be erected by the city at Crotona Avenue and the Southern Boulevard were filed yesterday at the Building Department. The structures will include the main hospital building, five

stories in height and standing on a plot 305 by 43 feet; a four-story power house, which will also contain a laundry and servants' quarters; a two-story brick stable and morgue, and a five-story nurses' home. The total estimated cost of these buildings is $560,315, of which $339,000 will be spent for the hospital itself, $129,000 for the power house, $52,315 for the stable and morgue, and $40,000 for the nurses' quarters. The plans were prepared by Architect Raymond F. Almirall.

Appeal for a Woman's Hospital.—An appeal for funds has been sent out by an organization concerned in the establishment of a hospital for women, for the purpose of affording relief to incurable cancer patients and for the treatment, study, and prevention of cancer. The hospital will be located in this city, and will be known as the Fairhaven Sanitarium. In the circulars issued by the organization the Commissioners of the State Board of Charities are said to have declared themselves satisfied with the necessity of such an institution as the one contemplated, as there is only one hospital in this city—the Montefiore Hospital—which admits incurable cancer patients. Before the Board of Managers can begin making any arrangements to incorporate and open the new hospital, however, $10,000 must be in hand. The dues have been fixed at $10 for annual members, $100 for life members, and $1,000 for patrons. Contributions for any amount will be received by Henry R. Wilson, President of the Lincoln Trust Company.

New Professorship of Pediatrics in Columbia.—Two gifts to Columbia University were announced by President Butler at the meeting of the Trustees Monday afternoon. The first was $60,000 from Horace W. Carpentier of the class of 1848 for the support of a chair in the Medical School in memory of his brother, the late Dr. Ruben S. Carpentier. The trustees voted to apply the income of this fund to the Chair of Pediatrics (diseases of children), and in recognition of the gift they named the chair, the incumbent of which is Dr. L. Emmett Holt, the Carpentier Professorship of Pediatrics. Dr. James R. Hayden was appointed Clinical Professor of Genito-urinary Diseases, in succession to Dr. Robert W. Taylor, who handed in his resignation to take effect on June 30. Dr. Arnold H. Knapp was appointed Clinical Professor of Ophthalmology.

Manhattan Dermatological Society.—Regular monthly meeting held Friday evening, April 1, 1904, at the residence of Dr. G. W. Crary, with Dr. Oberndorfer presiding.

The following cases were shown: Dr. Edw. Pisko presents five cases. (1) Lichen planus circinatus; the lesions in a girl of twelve years were best seen on arm and upper thigh; other typical papules were observed on the chest, abdomen and limbs, and a few on the face; the question of differentiating ringworm was decided by negative microscopic findings. Scratch marks on the thighs show the development of lichen papules. Dr. Oberndorfer saw this type on the penis in a general lichen of the body. Drs. Gottheil and Crary could not explain the evolution of circinate lesions except by coalescence of groups of papules; the healing center was rare. (2) A young man with characteristic syphilitic mouth lesions and a single circinate lesion on skin near inner canthus of left eye. The lesions in general outline and aspects resembled ringworm, but microscope decided negatively. Drs. Abrahams and Gottheil said the throat lesions and the negative microscopic findings helped to make a diagnosis of syphilis; the circinate form was rare but often met with in negroes. Dr. Oberndorfer stated that circinate lesions in early syphilis were not uncommon; the continuous margin of distinctly raised papules and their pearly appearance suggested lues. (3) A case of erythema multiforme; the lesions were by no means typical; in fact, the skin showed urticarial lesions; Dr. Pisko stated that the eruption had changed considerably within the past few days. (4) A middle-aged man with a lupus erythematosus of the nose and cheek, illustrating the beneficial effects of local applications of trichlor. acetic acid; a single application to a given area was sufficient; it must be gently applied and not rubbed in, otherwise deep ulceration may result; a small patch was covered at a time; usually 6, 8, or 10 such areas were treated, thus covering the entire patch. He treated eight cases within the past two months and recommended the remedy most highly. (5) A young man showing lichenoid lesions on right half of chest and abdomen and papules on neck; patient stated he used some strong liniment to relieve severe itching of the body; hence the latter lesions were considered traumatic while the papules on neck were regarded as most likely a true lichen planus.

Dr. L. Weiss presented a girl of fifteen years, showing innumerable small punctate pustules on forehead, and large acneform papules on face, with marked oily skin. The forehead also showed a high degree of dermatitis; the latter not artificial. Treatment consisted of soap lotions, peeling pastes, expression of comedones, and curette for large papules. Internally, iron, arsenic and strychnine. Dr. Weiss applied the term, follicular acne to the condition; Dr. Sobel called it acne, although the forehead was unusual; Drs. Moses and Gottheil suggested a mild form of treatment, believing better results would be obtained than by using strong peeling lotions and salves. Dr. Pisko called it acnitis. Dr. Bleiman makes a distinction between this case and one of simple acne; although the process was practically the same in both; the clinical picture was wholly different; he agrees with Drs. Moses and Gottheil in recommending mild treatment; since using the latter method the condition only began to improve. Dr. Crary would apply the term folliculitis to involvement of hair follicles and not to sebaceous follicles. Dr. Geyser stated X-ray treatment was almost a specific in these cases.

Dr. Gottheil presented the following cases: (1) A male with a lesion resembling a dermatitis confined to left index finger; the condition began as small flat pustules about one month ago; these ruptured, leaving a red, dry excoriated surface; neither the flexor surfaces nor the folds of adjacent skin are involved; this fact would tend to exclude it from the eczema class; Dr. Gottheil termed it impetigo circinatus chronicus. Dr. Abrahams said its localization, well-defined margins, slow progression and general aspects favored diagnosis of eczema parasitica. Drs. Crary and Pisko recognized a resemblance to dermatitis repens. Drs. Pisko and Bleiman spoke favorably of the use of 20 per cent. nitrate silver solutions locally applied. Dr. Cocks agrees with Dr. Abrahams in calling it parasitic eczema. Dr. Ochs saw good results from the use of sol. of kali permang. (2) A case of pigmented warts on the penis of three years' duration. (3) A case for diagnosis: A middle-aged woman shows large crescentic erythematous patches with raised margins, slightly scaling, and clear, slightly pigmented centers on both lower limbs; of many months' duration and slow progression; no mycelia found, and KI produced no result. Dr. Weiss entertained a possible diagnosis of erythematous lupus, and the suggestion was well taken by the members. Dr. Moses suggested erythrasms in an unusual location; he will examine scales for the fungus and report result at next meeting.

Dr. Crary showed a young woman with an enlarge-

ment of the sternal end of the left clavicle; present about one year, is getting slightly larger and is somewhat painful and worse at night. Patient gives only an incomplete rheumatic history. Dr. Gottheil said periostitis and thickening in this location was very suspicious of syphilis. Dr. Abrahams likewise called it syphilis. Dr. Moses advocated injection method, as bone lesions responded very slowly to internal medication.

Dr. Ochs presented a male, showing a suspicious sore on penis; of two weeks' duration and slightly indurated; no adenitis, no skin lesions; but throat shows a pharyngitis. Dr. Gottheil termed it a parchment chancre; Drs. Weiss and Abrahams would defer any opinion until two weeks had passed; they would prefer to await further developments.

Dr. Ochs also showed his case of onychorrhexis; he could not furnish any additional information as to its etiology but could report decided improvement in the condition since last presented. The nails seemed to respond to carbolic acid treatment. The patient's nails show decided improvement.

Dr. Oberndorfer presented a male with squamous lesions on both elbows, resembling psoriatic patches; patient had a similar outbreak ten years ago which responded to treatment. Presented as a case of chronic squamous eczema, resembling psoriasis.

Hospital Appointments.—Up to May 1, 98 men from the graduating class at the College of Physicians and Surgeons have secured interneships, graduate students have taken four places, and 11 have been made alternates, making a total of 113. In addition to the two appointments at the Almshouse and Workhouse hospitals, published in the MEDICAL NEWS of last week, two other appointments have been made, viz., Wm. Pincus and J. D. Malcolm. The following is the list for the past week: Passaic General Hospital, J. A. Wheeler, W. J. Duckett. St. Catharine's (Brooklyn) Hospital, E. O. J. Eytinge. Columbus Hospital, A. J. Ghiglione. Moses Taylor Hospital (Scranton, Pa.), H. A. Noble.

PHILADELPHIA.

Address by Dr. Sherrington.—Under the auspices of the medical faculty of the University of Pennsylvania, Professor Charles S. Sherrington, of the University of Liverpool, England, delivered an address in the Medical Hall, Thursday, May 5. The subject considered by Dr. Sherrington was "Cerebral Localization."

Graduate Nurses' Association.—The Graduate Nurses' Association of Pennsylvania met at Wilkesbarre April 20, the attendance being 100. The purpose of the meeting was to frame legislation compelling the registration of all graduate nurses in order to protect the public against impostors. Committees were appointed to urge the matter at the coming session of the legislature.

Meningitis at League Island.—Five cases of cerebrospinal meningitis and one death recently occurred at the League Island Navy Yard and Surgeon General Rixey hastened from Washington to outline plans for controlling the disease. Strict quarantine has been instituted and all the men quartered in tents. The authorities are confident that an epidemic similar to that of last year when 35 cases occurred will be prevented. The present outbreak is believed to be due to importation of the disease by a detachment of marines that recently returned from Panama.

Pasteur Treatment at Home.—The Pasteur treatment for rabies has recently been employed for the first time in this city by Dr. W. L. Forrester. The patient is a boy of four years who was bitten by a dog that post-mortem examination showed to be suffering from rabies. The boy was taken to New York where treatment was begun. He was then brought home and the necessary serum sent on each day and injected by the physician. No symptoms of the disease have developed and the danger limit has been passed for some days.

Phipps Institute.—Dr. Leonard Pearson, State veterinarian of Pennsylvania, has been appointed a member of the staff of this Institute and will accompany Dr. Ravenel on his European tour this summer. They will visit Italy, Holland, France, Sweden, Germany and England, studying the methods of those who have been experimenting with the inoculation and vaccination of both animals and human beings. The data thus gained will be given out by the Institute to the medical profession.

New Seaside Hospital.—The Jewish Maternity Association has purchased a property known as Leith Villa at Ventnor, N. J., which they will equip as a first-class seaside hospital. It will be placed in use during the coming summer in place of the one formerly conducted at Atlantic City. During last summer 326 patients were treated at the home, at an expense of $3,800.

To Disinfect Empty Houses.—A new step in the prevention of tuberculosis has been taken by the Department of Health. This is the disinfection of all empty houses on request of prospective tenants. The only requirement will be that the tenant guarantee thoroughly to clean the building before moving in.

Nurses Receive Diplomas.—Fifteen young women received diplomas at the commencement of the Polyclinic Hospital Training School for Nurses on April 29. Miss Maud Banfield, Superintendent of the hospital, spoke on "State Registration of Nurses." She urges this measure for the following reasons: The protection of the public, the protection of the nurses, and the improvement of educational standards among nurses. The principal objection comes from so-called schools that profess to turn out nurses after a ten weeks' course of lectures in a commercial building or after a course by mail.

Tuberculosis at the Zoo.—The Zoological Society of Philadelphia is to make experiments looking toward the prevention of tuberculosis in animals, this disease being one of the most frequent causes of death. An unused house in the garden is to be converted into a hospital where all new specimens will be received and examined and efforts made to produce immunity to the disease in question.

Tuberculosis Pavilions to Be Opened.—The six pavilions for the treatment of tuberculous patients at the Philadelphia Hospital are to be opened in the near future. They are situated in the extreme northwest corner of the grounds on an elevated site. The pavilions are 27 by 36 feet in size and so arranged that the entire four sides can be thrown open if so desired. Each will contain fourteen beds. The entire structure and the furniture is of iron or glass and the floor of artificial stone, thus allowing of the most thorough antiseptic cleansing of the surroundings of the patients.

Special Clinics for American Medical Association.—The medical schools and hospitals of Philadelphia have arranged for a special series of clinics and laboratory demonstrations as a compliment to the visiting members of the American Medical Association on their way to and from the June meeting in Atlantic City. The clinics will be held during the week preceding and the one following the session at At-

lantic City. The institutions contributing to this series are the University of Pennsylvania, Jefferson, Medico-Chirurgical, Polyclinic, Philadelphia, German, and Pennsylvania hospitals. Lunch to all members will be served each day in the University Hospital. Dr. John B. Roberts, of 313 South Seventeenth Street, will entertain at luncheon on Friday, June 3, at 2 P.M., members of the American Medical Association and of the American Academy of Medicine. The chairman of the committee on clinics is Dr. De Forest Willard, 1818 Chestnut Street.

Wills Hospital.—A meeting of the Wills Hospital Ophthalmic Society will be held Monday, May 9, 1904 at 8.15 P.M. The main subject chosen for discussion is Affections of the Lacrimal Apparatus. Introductory remarks: Etiology and Symptoms, by Samuel D. Risley, M.D.; Bacteriology and Microscopic Study, by Harold G. Goldberg, M.D.; Complications and Sequelæ, by S. Lewis Ziegler, M.D.; Treatment, by Wm. Campbell Posey, M.D. General Discussion by Drs. George C. Harlan, Conrad Berens, Frank Fisher, W. W. McClure, Charles A. Oliver, McCluney Radcliffe, P. N. K. Schwenk, William Zentmayer, and others.

CHICAGO.

Directors and Officers.—At a recent meeting of the stockholders of the Chicago Eye, Ear, Nose and Throat College, the following officers and directors were elected: Drs. Wm. A. Fisher, Adolphus G. Whippern, H. W. Woodruff, Thomas Faith, and John R. Hoffman. The directors thereupon elected Dr. Wm. A. Fisher President and Treasurer; Dr. Adolphus G. Whippern, Vice-President, and Dr. John R. Hoffman, Secretary.

Rejection of Inspection Plan.—Some time ago Mr. Hartung, Trustee of the Board of Education, made a plea for a more rigid examination of school children; but the school management committee of the Board has rejected the plan.

Opposition to the Location for the Erection of Hospital for Infectious Diseases.—As a result of a recent conference between Trustees of the Memorial Hospital for the Treatment of Infectious Diseases and owners of property in the vicinity of the proposed site for the institution, it was decided to call a public meeting of all persons interested in any way in the project to exchange views as to the direct danger of contagion and the benefits to be derived from the establishment of such an institution in that neighborhood. Dr. Billings explained the great need of such an institution in Chicago, and gave a brief outline of what are known as infectious diseases, their effects, and the best methods of treatment. He said there is no possibility of contagion from a properly conducted hospital. There is to-day in Chicago only one place where infectious diseases can be treated, and that is in the addition to the Cook County Hospital. No institution more beneficial to the public of the city of Chicago has been recently proposed. The aim is to treat certain infectious diseases, such as measles, diphtheria, and scarlet fever, in a scientific manner. This hospital is to be established on a purely philanthropic basis at the place where such diseases can be treated and studied from a scientific standpoint, in order that the germs of the disease may be located and proper means be determined upon for its extermination.

Compound Fracture of the Patella and Condyles.—At a recent meeting of the Chicago Orthopedic Society, Dr. A. E. Halstead reported the case of a man who, while riding on the platform of a fast train, was struck by an iron girder, prducing a compound fracture of the right patella. The external condyle of the femur was also nearly separated from the shaft, being attached only by the periosteum. A temporary dressing had been applied by an outside physician before the patient was brought to the St. Luke's Hospital. On September 8 last, the day of admission to the hospital, under general anesthesia, the wound was enlarged and the spicula of bone and the detached external condyle removed. The patella was found to have been broken into three fragments and the patellar ligament completely divided. After thorough lavage of the joint cavity with one per cent. solution of carbolic acid followed by decinormal salt solution, the patellar fragments were united by chromicized catgut suture. The ligamentum patellæ was sutured with mattress sutures of the same material. A cigarette drain was placed in the joint and the skin wound closed by silkworm-gut sutures. The drain was removed at the end of twenty-four hours. Following this a circular plaster of Paris cast was applied. This dressing was not changed for three weeks, when the skin sutures were removed. After this gentle passive movements and massage were practised daily. The result, as was shown, is ideal. The limitation of flexion and extension was but slight; the fragments of the patella have firmly united and the bone was freely movable. A case similar to this was treated by him at the County Hospital a short time ago. In this the patella was sawed through and the condyles partially divided by having the knee come in contact with the circular saw. The joint was thoroughly washed out and a large quantity of blood and foreign matter removed. The patella was sutured with catgut, the fragments replaced and the joint drained for twenty-four hours. In this case the result was all that could be desired. The man now has a freely movable joint, and no appreciable deformity.

CANADA.

Bill to Relieve Medical Students from Examination in the Province of Quebec.—Great interest and much indignation is being evoked among the medical fraternity of Montreal, the province of Quebec and as well among the medical student body over the appearance in the Quebec legislature of another of those bills having for its purpose the making of doctors out of students who have failed to pass the necessary and required matriculation examination. The present bill proposes to admit all who have begun the study of medicine prior to September last without passing their matriculation examination. Regularly qualified students denominate these medical "scabs" of whom there are said to be 260 in number. The profession in Montreal have held a meeting on the matter and are dispatching a deputation to the legislature to protest against this legislation.

Appointments.—Dr. L. deL. Harwood has been appointed to succeed the late Dr. Brennan as Professor of Gynecology in Laval University, and will also be chief of the gynecological department in the Notre Dame Hospital, Montreal. Dr. Harwood has also been chosen President of the gynecological section of the Medical Congress of French-speaking Physicians of North America which meets in Montreal this summer. For thirteen years Dr. Harwood has been connected with the gynecological department of Notre Dame Hospital.

Dr. Frederick Etherington, Kingston, Ont., has been appointed by Queen's Medical Faculty to the newly established tutorship in human and comparative anatomy. Dr. Etherington is now in Edinburgh but will return to Kingston in the early autumn and

hereafter devote all his time to the position to which he has been appointed.

These appointments have been made by Queen's Trustees to the Medical Faculty at Kingston: Professor of Pediatrics and Associate Professor of Obstetrics and Gynecology, Dr. Wood; Assistant Professor of Anatomy, Dr. Mylkes; Professor of Medical Jurisprudence and Toxicology, Dr. Williamson.

The Ontario Cabinet have approved of the following appointments on the staff of the University of Toronto; H. S. Hutchinson, M.B., and W. M. Meldrum, M.S., assistants in the chemical laboratory; R. H. Mullen, M.B., assistant demonstrator in pathology; F. W. Marlowe, M.D., F.R.C.S., Eng., assistant demonstrator in anatomy.

The Ontario Government have in contemplation the appointment of a physician to be general assistant to the various asylums of the province. He will act as a relieving officer.

To Check Consumption's Ravages.—A deputation from the Association for the Prevention of Tuberculosis waited on the Prime Minister, Sir Wilfrid Laurier, at Ottawa, last week, and asked for the establishment of a sanitarium in each of the provinces of the Dominion for the treatment of consumptive patients. It was pointed out to the Premier the need of such as there are annually 8,000 deaths in the Dominion from this disease. The Prime Minister pointed out that the British North America Act provided for provincial jurisdiction over hospitals, but he would consult with the Minister of Justice to see whether a point might not be stretched in this particular instance to provide for the Dominion aiding such institutions.

Montreal Western Hospital.—At the quarterly meeting of the Board of Governors of the Montreal Western Hospital held recently the question of the erection of a new wing was freely discussed, and it was at once decided to open subscription lists towards raising the necessary funds. The medical report for the quarter ending March 31 was submitted and it showed that during that quarter there had been admitted 133 patients, 61 males and 72 females. On January 1, 1904, there were in the wards 34 patients, 128 were discharged, 7 died and there remained 29 at the end of the quarter. In the out-door department the total number of consultations reached 1,783.

A Methodist Hospital for Toronto.—The late Hart A. Massey of Toronto, left $100,000 for the purposes of a Methodist hospital in Toronto, provided a like amount could be raised by private subscription. Now the leading organ of the Methodist body in Toronto, advocates that such an institution be gone on with, and it would appear as though Toronto really needed increased hospital accommodation, as during the past winter all of the hospitals were more than crowded. It is understood that the Medical Faculty of the University of Toronto, look upon it with much favor as the institution would likely be established close to their new medical building.

GENERAL.

American Medical Editors' Association.—The annual meeting of the American Medical Editors' Association will be held on June 6 at 2 P.M., Dennis Hotel, Atlantic City, N. J. Many interesting papers will be presented upon Medical Journalism and allied subjects by editors of recognized ability.

Gift for Tulane Medical School.—Under a decision rendered by the Louisiana State Supreme Court, April 25, Tulane Medical College receives the bulk of the estate of the late A. C. Hutchinson, who at the time of his death was President of Morgan's Louisiana and Texas road. Mr. Hutchinson's estate was valued at nearly $1,000,000 and most of it was left to Tulane University for the use of its medical college in the establishment and maintenance of a clinic and hospital for the sick.

State Board of Medical Examiners of New Jersey.—The examinations of the State Board of Medical Examiners of New Jersey will be held at Trenton, N. J., June 21 and 22. Application for the regular blanks should be made before June 11.

Statement by Prof. August Forel.—From August, 1879, until March, 1898, I was the Director of the Burghölzli Insane Asylum and Professor of Psychiatry at the University of Zurich and desire to make the following statement: Dr. Carl Bertuhringer, who designates himself a representative of the so-called Koenig Medicine Co., of Chicago, and who incidentally represents himself as a former assistant of Prof. Forel at the Burghölzli Asylum, was *never* my assistant and never an assistant at the Burghölzli Asylum. He did indeed study medicine in Zurich and, like other students, studied psychiatry with me, and practised in the Clinic as a so-called "Practikant," as did other students. Under these circumstances I once permitted him to hypnotize *one* patient. But he was never either my private or my asylum assistant and hence has no right to publish himself as such. Another Dr. Bertuhringer (Dr. Hans Bertuhringer) was actually assistant physician in Burghölzli and is now second physician at the Rheinau Asylum, Canton Zürich. But this is quite another person.—Dr. August Forel, former Professor at the University of Zurich, Chigny, Switzerland, April 6, 1904.

Florida Medical Association.—An amendment to the constitution and by-laws of the Florida Medical Association, making Jacksonville the permanent meeting place, has been submitted, and it has no opposition. Jacksonville also gets the president of the association for the ensuing year—Dr. E. N. Liell. The nominating committee of the house of delegates made the following report for officers for the ensuing year, which was adopted and said officers duly elected: President, E. N. Liell, Jacksonville; First Vice-President, J. W. Jackson, Miami; Second Vice-President, J. F. McKinstry, Gainesville; Third Vice-President, J. S. Holmes, Tampa; Secretary and Treasurer, J. D. Fernandez, Jacksonville. Resolutions were adopted strongly favoring a State Board of Medical Examiners. Drs. W. L. Hughlette, J. H. Durkee and J. N. Fogarty were appointed as a committee on revision of the constitution and by-laws, to report at the next annual meeting. A committee from the American Medical Association, relative to the importance of a uniform system of registration of vital statistics, was referred to the committee on legislation to prepare a bill to be presented at the next session of the Florida Legislature and to urge its passage. Following papers were read and discussed: Surgery—Dr. J. N. Fogarty, chairman. Treatment of Trachoma, by Dr. J. H. Claiborne of New York. Report of a Case of Hepatic Abscess, and Report of a Case of Strangulated Hernia, by Dr. J. N. Fogarty, Key West. Remarks on the Pathology and Treatment of Appendix Abscesses, with report of an illustrative case, by Dr. Carey P. Rogers, Jacksonville. Medicine—Dr. Arthur L. Izlar, chairman. Paper on Anchylostomiasis, with exhibition of the parasites, by Dr. Aug. E. Unter, Greenville. Paper on Static Electricity, by Dr. Will White, Live Oak. Treatment of Affections of the Skin by the X-ray; High Frequency and Brush Discharges from a Static Machine, by Dr. R. P. Izlar, Waycross, Ga. Cerebrospinal Fever at Madison, with Report of Cases, by Dr. A. L. Blalock, Madison. A Few Observations on Typhoid Fever, by Dr. J. D. Love,

Jacksonville. Diseases of Children—Dr. J. D. Bennett, chairman. Gynecology—Dr. L. M. Anderson, chairman. Ovarian Abscess; Sarcoma of Breast; Report of Rare Cases Operated Upon, with Specimens, by Dr. Edward N. Liell, Jacksonville. Leucorrhea in Married Women, by Dr. L. M. Anderson, Jasper. Subinvolution of the Uterus, by Dr. R. L. Goodbred, Mayo. Hygiene—Dr. Eduardo Andrade, chairman. Some Remarks on the Bacillus of Diphtheria and Anisokoria (inequality of the pupils), by Dr. Eduardo Andrade, Jacksonville. Paper on Cerebrospinal Fever (?) at Madison, A Report on the Recent Epidemic, by Dr. Hiram Byrd, Madison. Following resolution was adopted and the association adjourned *sine die; "Resolved,* That the Florida Medical Association hereby expresses sincere gratitude to the railroads of the State and the hotels of Live Oak for courtesies extended, to the citizens of Live Oak and the Suwannee County Medical Society for their free-handed, large-hearted hospitality, to the committee of arrangements, of which Dr. T. S. Anderson is chairman, for making the social features of the association a success, and to Col. Frank Drew of the Suwannee and San Pedro Railroad for his special attention to the profession, for furnishing his private car for excursion to Half Moon Lake."

American Proctologic Society.—The sixth annual meeting will be held at Atlantic City, N. J., June 8 and 9. The profession is cordially invited to attend all meetings. This is the program: President's Address, by W. M. Beach, M.D. Things of Specialism and of this Society that Make for Optimism; The Surgical Treatment of Prolapse of the Rectum, by J. M. Mathews, M.D., Louisville; Further Observations in the Treatment of Pruritus Ani with the Roentgen Rays, by J. R. Pennington, M.D., Chicago; My Method of Dealing with Perirectal Infections; Case Reports and Illustrations, by Jno. L. Jelks, M.D., Memphis; A Consideration of the Present Status of the Treatment of Cancer of the Rectum, by Lewis H. Adler, Jr., M.D., Philadelphia; Sterile Water Anesthesia in the Office Treatment of Rectal Diseases, by S. G. Gant, M.D., New York; The Utility and Practicability of the Flexible Rectal Tube, by S. T. Earle, M.D., Baltimore; Polyadenomata of the Rectum; Report of a Case, by G. B. Evans, M.D., Dayton; Some Observations on the Treatment of Rectal Diseases, by Wm. L. Dickinson, M.D., Saginaw; Results of the Treatment of Cases of Obstipation Due to Acquired Valvular Hypertrophy, by Thos. Chas. Martin, M.D., Cleveland; Rectal Valves, with Report of Operative Cases, by Louis J. Krouse, M.D., Cincinnati; Simple Fistula in Ano, by Howard A. Kelly, M.D., Baltimore; The Proctologist; the Necessity for His Being an Accomplished General Surgeon, by Floyd W. McRae, M.D., Atlanta; Clinical Cases, by Jas. P. Tuttle, M.D., New York; Adrenalin and Rectal Diseases, by A. Tierlink, M.D., Gand, Belgium; A Paper, by Geo. J. Cook, M.D., Indianapolis; One Thousand Operations for Hemorrhoids without a Death; with Remarks, by Leon Strauss, M.D., St. Louis.

The Sheppard and Enoch Pratt Hospital, Baltimore.—A Conference in Psychiatry and Neurology will be held at this hospital on Monday, May 9, 1904. Following is the program: On the Nature of the Disease Process in Insanity, by Adolf Meyer, M.D., Director of the Laboratory of the N. Y. State Hospital; Congenital Spastic Rigidity (Little's Disease), by William G. Spiller, M.D., of Philadelphia; Development of Insane Ideas, by Stewart Paton, M.D., Director of Laboratory Sheppard and Enoch Pratt Hospital; The Sensory Distribution of the Fifth Nerve, by Harvey W. Cushing, M.D., Johns Hopkins Hospital; Amaurotic Family Idiocy, by Bernard Sachs, M.D., of New York; Statistical Data in Paresis, by Edward N. Brush, M.D.; Mechanism of Exophthalmos: Pulse and Blood Pressure Curves in Manic Depressive Insanity, by William B. Cornell, M.D., Clinical Assistant Sheppard and Enoch Pratt Hospital; Spinal Puncture as a Diagnostic Procedure in Paresis, by George E. Chinn, M.D., Clinical Assistant Sheppard and Enoch Pratt Hospital; Delirium Following Operations on the Bile Duct, by J. M. T. Finney, M.D., Johns Hopkins Hospital; Demonstrations of Specimens, by George Streeter, M.D., Johns Hopkins Medical School; Methods of Examination by the Pupil, by Henry M. Thomas, M.D., of Baltimore.

OBITUARY.

Dr. EDWARD LIVINGSTON TRUDEAU, JR., son of Dr. Edward L. Trudeau of Saranac Lake, died of pneumonia last Tuesday at his home, 772 Park Avenue. He was thirty-one years old, and was born at Saranac Lake. His academic education was gained at Yale University, where he was graduated in 1896. From Yale he came here to the College of Physicians and Surgeons. Having graduated in 1900, he spent two years in the Presbyterian Hospital, and then started to practice for himself last fall. In December he was married to Miss Hazel Martyn of Chicago. He was a member of the University and Yale Clubs, and attended the clinics of Bellevue and Vanderbilt Hospitals.

Dr. THOMAS JOHN CHEW, a well-known physician of Washington, died at his home in that city last Monday, in the fifty-eighth year of his age. He was born in St. Mary's county, Maryland, graduated from Princeton and later from the medical school of the University of Maryland. After practising his profession in Prince George County, Maryland, for several years, he moved to Washington.

CORRESPONDENCE.

OUR LONDON LETTER.

(From Our Special Correspondent.)

LONDON, April 23.

DEATH OF SIR HENRY THOMPSON—THE PIONEER OF ANTI-VIVISECTION IN ENGLAND—THE PROPHET OF SELF-HELP—THE PASSING OF A FASHIONABLE BONE-SETTER.

THE medical profession of this country has lost one of its oldest and most distinguished members in Sir Henry Thompson who died on April 18 in his eighty-fourth year. A few weeks ago I saw him at a leading Club to which he had come to record his vote for a friend whose name had come up for ballot. He looked so feeble as he was helped down the steps and into his motor that it struck me the end was not far off. He was born at Framingham in Sussex in 1820. Of his early years nothing is recorded. There is a legend that he began life as an assistant in a shop. Whether there is any truth in this or not it is certain that he did not take up the study of medicine till comparatively late in life. He studied at University College, London, and took his degree at the age of thirty-two years in 1852 at the same time as his fellow-student, Joseph Lister. He soon afterward married Miss Kate Loder, a well-known pianist, whose earnings smoothed his path to success in his profession. Early in his career he specialized in genito-urinary diseases. He was, I believe, one of the founders of St. Peter's Hospital for Stone, but had to resign his connection with that institution on his appointment to the surgical staff of University College Hospital. He rapidly made his way to the front in his own line, and in 1863 he operated on the late King of the Bel-

gians. This brought him, in addition to a fee of $15,000, the honor of knighthood and a vast increase of practice. In 1872 he operated on the Emperor Napoleon III., but the fatal issue of the case exposed him to severe criticism not only among French surgeons but among his own countrymen. His treatment of stricture in the person of a lord-in-waiting was severely animadverted on by so competent a judge of this branch of surgery as our gracious sovereign Edward VII. In operating Thompson took for his motto Danton's maxim, *de l'audace, toujours de l'audace,* not allowing himself to be deterred by considerations that would have made a careful surgeon stay his hand. Often the event justified his boldness, but sometimes the patient paid the penalty of rash surgery. Then the blame was laid on assistants or nurses. I have seen him perform lithotomy, using considerable violence in extracting the stone, and when post-mortem examination showed that the bladder had been extensively torn, calmly attribute the disaster to an eminent colleague who had held the staff. He was a showy operator, with a shrewd eye for dramatic effect in his entrance, his pose and in his handling of instruments. Within his own province he was for a long time unrivaled in this country. The collection of calculi which he presented to the Royal College of Surgeons bears testimony to the extent of his practice. In general surgery, which his position on the staff of a general hospital obliged him occasionally to undertake, he was somewhat of a terror to his colleagues. It used to be said that he was stopped in the act of attempting to remove the body from a limb, and Berkeley Hill, who had been his pupil, carried with him to the grave the scars of cuts made by Thompson recklessly wielding an amputating knife.

Thompson's professional income was estimated at from $50,000 to $75,000 a year. In his private practice he always operated as early in the morning as possible so that, if bleeding occurred, it might be dealt with in daylight. Probably no surgeon was ever more disliked by his patients. In his later years indeed he would have lost much of his business had he not had the good fortune to have assistants whose devoted attention and charm of manner smoothed away the asperities of their chief. It must be added that Thompson was not popular with his professional brethren. For this his self-assertiveness and combativeness were mainly responsible. There is a curious unconscious revelation of his own character in the novel which he wrote under the name of "Pen Oliver." A medical student calls on an eminent physician to ask for some information not of a professional nature. On leaving he hands the doctor a fee which is accepted as a matter of course!

Thompson dabbled in many things besides surgery. As has just been mentioned he wrote novels of indifferent literary quality. He achieved a respectable mediocrity as an amateur painter, and was frequently allowed to exhibit his works at the Royal Academy. He was a collector of pictures and china. He had an astronomical observatory of his own. He was the author of books on gastronomics and gave dinners called "octaves" because there were eight guests and eight dishes. It is recorded that he once received a visitor in his studio in which he had for companions a young python and a boa constrictor. This recalls Sarah Bernhardt, and indeed Thompson was always a *poseur.* He had enough of the artistic temperament to make him eager to keep himself in the public view and to impress himself on all with whom he came in contact. It must, however, in fairness be acknowledged that he did good work as a social reformer in more than one direction. To him it is mainly owing that cremation has come to be recognized in this country as a lawful mode of disposing of the dead. He was a strong advocate of temperance not only in drinking, but in eating to excess, to which he attributed many of the infirmities that make old age a painful disease to a large number of persons. Within the past year or two he preached the hygienic advantages of automobilism, especially as a remedy for insomnia. Only a few weeks ago he was vigorously denouncing the dirty condition of our London streets and the apathy of our municipal and sanitary authorities with regard to this evil. With all his defects of character, it must be admitted that Sir Henry Thompson was a man of vigorous personality, a leader in his particular province of surgery and a many-sided and accomplished man.

Cremation finds favor with a good many people because it prevents any possibility of premature burial. A notable instance of the haunting fear of this accident is seen in the case of Miss Frances Power Cobbe, well known as an advocate of women's rights and an uncompromising and, it must be added, unscrupulous opponent of vivisection, who died a week or two ago. Her will contained a solemn injunction that her medical attendant should perform "on my body the operation of completely and thoroughly severing the arteries of the neck and windpipe, nearly severing the head altogether, so as to render any revival in the grave absolutely impossible. If this operation be not performed and its completion witnessed by one or the other of my executors and testified by the same, I pronounce all the bequests in this will to be null and void." A letter written by Miss Cobbe to the President of the London Association for the Prevention of Premature Burial, some time ago, shows how great was her fear of being buried alive. She said: "I am obliged to you for sending me 'Perils of Premature Burial.' It is a terrible subject, and one that has haunted me all my life, insomuch that I have never made a will without inserting a clause requiring my throat to be cut before I am put under ground. Of course, one can have no reliance on doctors whatever, and I have myself known a case in which a very eminent one insisted on a coffin being screwed down because the corpse looked so lifelike and full of color that the friends could not help indulging in hopes. My great grandmother, after whom I am called, a famous heiress, was a notable case of narrow escape. As a girl she passed into a state of apparent death, and a great funeral was ordered for her. Among the guests came a young girl friend, who insisted that she was not dead, and raised such a stir that the funeral was postponed, and time was allowed to pass till the marvel became that there were no signs of change. I could never ascertain how long this comatose state lasted before she recovered; but she *did* recover, so thoroughly that after her marriage with Richard Trench, of Garbuly, she became the mother of twenty-two children. Obviously this was no case of a feeble, hysterical, cataleptic subject." Among the well-known people who have been haunted by the fear of premature burial may be mentioned Harriet Martineau who bequeathed her doctor $50 on condition that he saw that her head was amputated before interment; Lady Burton, wife of Richard Burton the explorer, who directed that her heart should be pierced with a needle and her body submitted to post-mortem examination before burial; and Edmund Yates, Editor of the *World,* who left a fee of $100 to his doctor for the same purpose. Miss Cobbe's instructions were carried out by Dr. Hadwen, of Gloucester, a prominent antivivisectionist and antivaccinist. Miss Cobbe was the Cato of the antivivisection cause. Her cry was *Delenda est Carthago,* and she would accept no compromise. This led to a split in the camp, Mr. Stephen Coleridge becoming the leader of a party which professes to aim at the regulation of vivisection, while Miss Cobbe and her intransigent followers insisted on its suppres-

sion. With this object she founded a new society which issued a journal entitled *The Abolitionist*, in which she preached her views with a virulence and scurrility which clearly displayed the cruelty in regard to man that so often underlies the excessive love of animals. She had, however, lost whatever importance she may ever have possessed as a controversialist, since her methods were exposed by Sir Victor Horsley at the Church Congress held at Folkestone twelve years ago.

Samuel Smiles, the author of Self-Help, a book which reckons its sale by millions and which has been translated into nearly every European language, died a few days ago at the patriarchal age of ninety-two years. He began life as a medical practitioner at Haddington, but success not coming speedily enough he became in turn editor, secretary of a railway company, and author of popular biographies of famous engineers and other heroes of practical and business life. His writings have had an immense influence on aspiring young men of the artizan and small tradesman class, but at the present day his teaching, which may be summed up in the phrase, "How to make the best of Both Worlds," has rather lost its hold on the public mind.

English society is mourning the death of a fashionable bone-setter, "Professor" John Washington Atkinson. He knew more of the anatomy of the human body, for he was a qualified veterinary surgeon, and would probably have found it easy to obtain a regular diploma in medicine. But the brain, of what Falstaff calls "this curious-compounded clay, man," being what it is, he doubtless found it more profitable to pose as having knowledge not revealed to orthodox practitioners. He professed to be a specialist in "bloodless surgery" and when Lorenz was over here denounced him in the "society" papers with the fervor of a rival prophet. He had an enormous practice among members of the "upper ten" and had as many as a dozen assistants at work on his patients. Royalty did not disdain to patronize him, and some of the foremost men in the surgical world had to meet him in consultation—of course privily and under seal—under penalty of losing their august patients.

THE NEGRO AS A DISTINCT ETHNIC FACTOR.

To the Editor of the MEDICAL NEWS:

DEAR SIR: There are several important facts belonging to the Negro Question that unfortunately are only well understood by the scientist and physician. Those who have lived among the negroes and studied their inherent race characteristics; and the medical men who have studied the African in the hospital and on the dissecting table, are fairly agreed upon one fact, *i.e.*, that the negro is a distinct ethnic factor in civilization; that his animalism is a biologic factor no more amenable to educational influences than is the biologic origin of his color or odor. The anatomical and physiological conditions of the African must be understood; his place in the anthropological scale realized and his biologic basis accepted as being unchangeable by man before we can scientifically and humanely place this ethnic factor where it belongs. Let it first be understood that there can never be any interracial relations of Caucasian and African, socially or sexually. The African is unlike the Caucasian in *secondary* sexual characters, and this being so he can never be absolutely alike in the highest psychical processes. These facts are ignored by those who would have the African brought into social relations with the white woman, and by those who ignorantly believe that a few years of Latin and Bible teaching will deprive him of periodical erethisms of the sexual centers. When education and religious teachings change the biologic basis of his color it will also be able to change the anatomical and physiological reason for his sexuality and bestiality.

The Caucasian as a race is moral; the African as a distinct race is not immoral, he is unmoral, and no amount of education or training is going to change a non-existing element. This fact should never be lost sight of; it is one of the causes which produce the great psychical differences between the white and colored races. Biologic differences between races of distinct ethnic origin result in psychologic and social differentiation impossible to harmonize.

It is unscientific to attempt to study the adjustment and laws of society without a thorough knowledge of the structure of its individual parts. It is useless for philanthropists, preachers, and editors in the north, or any other part of the country where the African is not understood or studied, to talk about school and college education controlling his hereditary racial instincts. His individual parts are not known to such people. Only he who knows life from the monad to *cell complex man* can intelligently discuss the negro question. To understand the ineradicable racial traits of the African one must know the structural life and habits resulting from a certain biologic basis. We must penetrate beneath superficial ideas, throw aside prudish philosophy, and open our eyes to anatomical and psychical facts if we wish to render justice to civilization. Silence regarding sexual matters must give way to vocative statements; for it is by these unavoidable statements that we must be guided in dealing with the Negro Question.

This great question can only be solved by dealing in concrete facts, not abstract principles; the latter method has been too long in vogue and has resulted in a miserable failure. As an example: The belief that the African was capable of living as hygienically and morally as the Caucasian was the great mistake made by those who deal in abstract principles. Physicians know that this false idea sets in action three of the most powerful enemies of mankind; insanity; tuberculosis and syphilis —diseases which have been so conscientiously studied by the best minds during the last ten years, and whose causes and remedies we are beginning to comprehend. There is every prospect of checking and reducing these diseases in the white race, if this race is socially—in every aspect of the term—quarantined from the African.

It is not necessary here to dwell on the main anatomical points of difference that are known to exist between the Caucasian and the African. These variations show conclusively to the student ineradicable racial traits. The phylogeny of the negro will exert itself under all conditions. Those who would give the African equal social recognition, who sincerely believe that instruction in the humanities will in a few decades bring him to appreciate and understand the ethical and moral code of the Caucasian, forget that centuries of contact with the brain worker has not produced any mental effect in the African beyond those emanating from the medulla. Education as it is understood by the white man will never, in the full-blooded African, affect centers above those governing the animal instincts. It is a fact observed by those who are in a position to study the full-blooded negro that with the advent of puberty all intellectual development ceases; even the "sound memory," which is the cause of much apparent precociousness, seems to be submerged by the growth and activity of sensuality. With the advent of puberty the negro shows his genesic instincts to be the controlling factor of his life. These take hold of religion, control his thoughts, and govern his actions. In the increase of rape on white women we see the explosion of a long train of antecedent preparation. The attacks on defenseless white women are evidences of racial instincts that are about as amena-

ble to ethical culture as is the barrier which keeps the philanthropist and moralist from realizing that the phylogenies of the Caucasian and African races are divergent, almost antithetical; and that it is gross folly to attempt to educate both on the same basis.

WILLIAM LEE HOWARD.

Baltimore, Md., April 20, 1904.

SPECIAL ARTICLE.

CYTOTOXINS AND CYTOTOXIC IMMUNITY.*

BY PROFESSOR PAUL EHRLICH, M.D., LL.D.,
OF FRANKFORT-A.-M., GERMANY.

IN opening this lecture, Prof. Ehrlich traced the development of our knowledge concerning bacteriolysins and cytolysins and then alluded to the importance of this domain of research. The extent which the subject has attained is shown by the enormous amount of literature which has appeared during the last few years,—in quantity almost too great to master.

The mode of action of amboceptors and complements was first considered. The interpretation of Pfeiffer, Metchnikoff and Bordet's demonstration of the participation of two substances in producing bacteriolysis was made clear by means of absorption experiments and experiments at low temperatures. This led to the establishment of the amboceptor theory. The amboceptor, which is the specific product of immunization, unites by means of one haptophore group with the receptor of the susceptible cell, and by means of another haptophore group, with the complement. The complement has one chemical group suitable for union with the amboceptor, and another, the zymotoxic complex, which causes the injury to the cells. In opposition to this, Bordet devised his theory of "sensitization."

For the theory of direct union, between cell-receptor, amboceptor, and complement, Ehrlich then submitted the following evidence: (1) The demonstration of well-established chemical analogues, as seen in the anilin dyes. (2) The side-tracking of complements by an excess of free amboceptors, as was proved in the case of bacteriolysis by Neisser, and also, firmly established by Morgenroth for hemolysins by the employment of anti-amboceptors. (3) The existence of products from the breaking down of amboceptors,—amboceptoroids, which are no longer anchored by the cell but are still able to divert complements. The amboceptor then really acts like the mordant of a dye. The complete hemolysin thus forms an analogue of a toxin, in which one part, the amboceptor, corresponds to the haptophore group, the second part, the complement, to the toxophore group.

The complement, contrary to the conception of Bordet, is believed by Ehrlich to be made up, not of a single unit, but of a great many partial-complements, which side by side, and simultaneously, become attached to the amboceptor. Accordingly the amboceptor contains a whole series of complementophilic groups, and not a single one, as was first supposed. The diverse amboceptors which can belong to one animal species differ specifically only in those haptophorous groups which are concerned in the union with the cell, while they are identical, or at least very similar, as far as their complex complementophilic component is concerned.

The proof of the multiplicity, as opposed to the unity of the complement can be shown by the method of partial absorption, by the selective destruction of single partial-complements, by the demonstration of anti-complements which inhibit only a certain part of the complement action, and finally, by the evidence brought forward by Metchnikoff, that by the disintegration of microcytes or of macrocytes, at least two complements arise, which differ in their effects, one producing hemolysis, the other, bacteriolysis.

In each individual instance of lytic action it is not necessarily the whole series of complements, but only a certain fraction of them which he termed the dominant complements, that is concerned.

Ehrlich then discussed the theory of amboceptors. The latter are cell products. In the protoplasm of cells, in addition to the simple receptors which give rise to the antitoxins, there are more complicated receptors, which serve in the absorption of the more complex albuminous molecules. Two varieities of these receptors must be distinguished. In the first place, receptors of the second order are those, which in addition to their anchoring haptophore groups, possess a chemical complex which is distinguished by its power to set going coagulative processes, and which is generally quite resistant to heat. As the result of immunization with cells or albuminous material, receptors of this order appear in the serum as coagulins or agglutinins.

In the second place, amboceptors arise from receptors of the third order, which are concerned with the fixation and assimilation of the very largest food molecules. For the catabolic changes of these molecules there are needed a whole sequence of processes, which can only be carried out by a multitude of fermentative agents, such as the complements. Corresponding to this conception, the receptors possess a multitude of complementophilic groups. The reason why these adjuvant groups do not actually occupy the receptors, which would present the simplest solution, may be looked for in their extraordinary lability, which may render necessary a continual rehabilitation and renewal of the fermentative apparatus. This view is favored by the fact that such an arrangement does exist in the case of the receptors of the second order, whose agglutinophore complex, as already mentioned, is relatively stable.

The purpose of protecting these complements from destruction would not be attained if the affinity of the complementophilic groups were such that the complements were continually being absorbed by the receptors. A well adjusted mechanism controls the complement absorption, for by union of the haptophore group with a nutrient molecule, the avidity of the complementophilic group of the receptor is so augmented as to permit its combination with a complement. This is an economy which enables the labile ferment to reach the cell at exactly the favorable moment for its utilization. The proof of the actual occurrence of this increase is furnished by Bordet's phenomenon so-called, in which a selected material, after it is laden with amboceptors, is able to remove complements suitable for itself and also for all other combinations.

Amboceptors can be produced by immunization which are specific antibodies for a great number of albuminous materials, and Ehrlich alluded to the fact that the study of these amboceptors will probably give us a much clearer view than we can now obtain, into the process of assimilation.

We must suppose that those parts of the protoplasm which are bearers of the receptors of the second and third order, must be completely immune to the destructive action of the zymotoxic groups of the complements. There is no direct proof of the partial separation of these particles of protoplasm, yet such a separation probably exists, from the fact that complements are able to destroy their own cells if they are artificially brought into relationship with certain other constituents of the cell. This is effected with extreme ease by the aid of cytotoxic amboceptors, which can be readily produced for all kinds of cells. In this connection he alluded to the

* Third Herter Lecture, delivered at Johns Hopkins University, Medical Department, April 14, 1904.

fact that the erythrocytes of a sheep, which are laden with specific hemolytic amboceptors, will show no signs of injury so long as they are suspended in normal salt solution, but they will be dissolved at once upon the addition of the same serum which was removed from the sheep with the erythrocytes. This demonstrates that the most important agents of the body economy are turned into deadly weapons if brought into a false relation to the protoplasm.

Prof. Ehrlich next considered the theories of the pleuralistic conceptions of cells. Cells are complexly constructed organisms. Each of them possesses an extreme number of separate components, which from a purely theoretical point of view are capable of producing an equal number of specific reaction products. It is probable that each morphologically different cell constituent, such as the protoplasm, nucleus, etc., is capable of producing a serum specifically antagonistic to this particular structure, which serum in turn may be made up of a whole series of partial components.

The number of specific antibodies produced by immunization is usually much smaller than the number of antigenetic substances inoculated. Among the conditions which lead to this result are the deficiency of suitable receptors in the immunized species of animal, and insufficient formation or insufficient shedding of these receptors. He then described the methods for demonstrating the phenomena of pleurality, including the crossed absorption experiments and employment of antiamboceptors, and the examples from hemolysis. An immune serum in the former restricted sense of absolute specificity does not exist, we can only speak of the specificity of one amboceptor type for one definite causative substance. Since the immune sera contain a great number of different fractional components, which in turn can occupy a correspondingly great number of receptors, and since not the whole number of receptors of any one cell are peculiar to this cell, but a variable number of them are also common to other nearly related cells, we must conceive that a serum produced by immunization with a certain type of protoplasm, while it exercises its chief action against this protoplasm, also exhibits its action upon a whole series of other substrata of protoplasm. The more closely related the receptor apparatus of two immunity producing agents is, the more completely do the sera produced by them correspond in their action.

SOCIETY PROCEEDINGS.

NEW YORK PATHOLOGICAL SOCIETY.

Stated Meeting, held January 13, 1904.

The President, William H. Park, M.D., in the Chair.

Blood from Cases of Lymphatic Leucemia.—Mr. L. B. Goldhorn presented a number of specimens of this material. He said that from the hematological point of view, which was the only proper one, lymphatic and myelogenous leucemia could be easily separated, while from the point of view of pathological anatomy such distinctions could not be made. It seemed to the speaker that the myelogenous form was, so to speak, a new growth of those centers of the bone marrow which give origin to the granular leucocytes of the blood, while the lymphatic form was a hyperplasia of those centers which supply the blood stream with lymphocytes. Both types of tissue could form metastases like malignant new growths, the pathological changes in the viscera depending upon them, and just as no two cases of carcinoma with metastases are alike, so no two cases of leucemia are alike. Inasmuch as leucemia is not a disease of the blood proper, it was therefore to be expected that the changes in the blood and plasma would vary as the nature and the seat of the matastases vary. In myelogenous leucemia the speaker was inclined to look upon the mast cells as the only characteristic form,—their enormous increase being so constant a feature that they appear as pathognomonic, for while there are many diseases in which the myelocytes are increased, myelogenous leucemia seemed to be the only one in which these cells were so abundant as to give a characteristic aspect to the blood picture. The speaker suggested for rapid demonstration of this type of cell a saturated solution of a basic dye such as methylene blue or dahlia, in ordinary wood alcohol. The granules are brilliantly stained by applying this solution to the unfixed blood smear for a few seconds, and then washing in distilled water. In what has been termed mixed leucemia an enormous increase in the various granule bearing leucocytes was seen together with what appeared to be large mononuclear cells. This, in the speaker's opinion, was not a leucemia of double, that is, of myelogenous and lymphatic origin, but one of a purely myelogenous source in which the mononuclear cells were not lymphocytes but the mononuclear and transitional cells of Ehrlich. A mixed leucemia would, under these circumstances, appear to be a very rare occurrence, as rare as carcinoma with a sarcomatous element. In determining the hemoglobin in these cases, Mr. Goldhorn recommended the use of the Tallqvist hemoglobin book because its readings were not interfered with by the greatly increased number of leucocytes. He could not recommend this book for general use, because in all cases of lessened oxygenation of the blood, and especially where marked cyanosis was present, the readings were much too high.

Dr. F. C. Wood said that the difficulty of determining the hemoglobin in blood containing a large number of leucocytes could be easily overcome by using the Fleischl-Meischer hemoglobinometer, and after filling the diluting pipette with the blood and distilled water to blow out this mixture into a centrifuge tube and remove the white corpuscle by centrifuging. This would take only a few minutes, and the cells of the hemoglobinometer could be filled with the clear supernatant fluid and an accurate determination easily carried out. If the hemoglobin content were low, a one to one hundred mixture could be made and centrifuged, instead of the usual one to two hundred dilution used for the Fleischl-Meischer apparatus.

Comparative Morphology of Vaccine Bodies.—Dr. James Ewing presented specimens and drawings of vaccinia of the rabbit's cornea, frog's skin and cornea, and mud-puppy's (*Necturus*) skin; diphtherial necroses of the rabbit's cornea, frog's cornea and skin and salamander's skin, and the skin of a case of measles dying in the full eruptive stage of the disease. The specimens were stained by fuchsin and indigo carmine (Borrel's method). In describing the specimens the speaker said in taking up the study of variola in 1901, he had chiefly in mind the hope that the application of Nocht's stain to smear from the lesions of the skin and respiratory mucous membrane might be successful in demonstrating the presence of a protozoon. The results proved negative. Likewise the results of a study of fresh material examined on a warm stage, from variola and vaccinia were negative not only as to the presence of any recognizable protozoon but as well in regard to the question of ameboid motion of any definite structures in the tissues. The histological study of the tissues while defining a great many structures which suggested a protozoon origin had left him as it had previously left the majority of observers, not only in doubt about the origin of many of the suspicious forms, but with the moral cer-

tainty that the morphological study of the vaccine body series in variola and vaccinia could hardly be relied upon to yield positive conclusions even to the most experienced observer, while the type of evidence reasonably demanded to convince others of one's conclusions regarding the nature of these bodies seemed much less likely to be obtainable from this line of study. It seemed possible, however, that the study of changes in the epithelial cells of other classes of animals which might be made to react to vaccine could yield information of value by establishing a comparative morphology of vaccine bodies. The conflicting statements regarding the possibility of producing genuine vaccine bodies by other means than by vaccine also suggested that this subject deserved attention from the same point of view, and would especially assist in separating simple degenerative products from what might prove to be a real protozoon among the host of peculiar structures seen in variolous lesions. With these objects in view he had compared the changes occurring in the epithelial cells in human variola with those occurring after vaccination in the rabbit, frog, mud-puppy (*Necturus*) and salamander, with those resulting from the action of diphtheria toxin, after Sikowsky's suggestion, in the cornea and skin of the rabbit, frog, and mud-puppy, and with those seen in measles. Among the characteristics of the ordinary vaccine body might be mentioned the perinuclear position which is not invariable, the clear zone surrounding the body which is probably an artefact but a very constant one with the larger bodies and the variable staining reaction, some bodies being basophile, others acidophile, many showing both basophile and acidophile portions. The more recently added members of the series, including signet rings, rosettes, crescents, and "encysted" bodies, must be regarded at present as of uncertain relation to the simpler bodies first described by Guarnieri. According to his own observation the most significant features of the ordinary vaccine body is the fact that some are basophile, some acidophile, and others possess both basophile and acidophile portions either compact or granular or vacuolated.

Bodies Produced by Vaccination of the Frog's Skin and Cornea.—Proceeding to a brief description of the bodies observed apart from variola in man or vaccinia of the rabbit's cornea, might be mentioned first the bodies produced by vaccination of the frog's skin and cornea. Here he had more negative than successful results and had inoculated many frogs without any definite effect on the epithelial cells. In the best results a localized lesion of the cornea, and a more diffuse lesion from extensive scarification of the skin were observed. In both locations the bodies were much more numerous than in variola, and included many small acidophile and basophile perinuclear forms, some rings, cysts containing 10 to 50 homogeneous globules or vacuolated bodies or rings. In the frog's skin the specimen exhibited seemed to show rather clearly that many of the bodies had resulted from the comminution of the nucleus Others had a different origin which seemed explicable from the changes produced by diphtheria toxin. In the same locations in the frog diphtheria toxin in twenty-four to forty-eight hours induced cell changes and nuclear and cytoplasmic alterations which seemed to differ from those following vaccination only by their greater intensity. Mechanical influence might have been responsible for some of the changes following vaccination of the frog's skin but not in the cornea, but numerous negative results of vaccination of the frog's skin indicated that the effects of trauma were unimportant. He was inclined to believe that a true progressive vaccine process existed in the skin of the frog in the case exhibited since this lesion was so extensive.

Comparing the lesions produced by diphtheria toxin with those of vaccine in the rabbit's cornea, there appeared many points of similarity and quite as many differences. The toxin failed at least after forty-eight hours to cause the swelling of the cell layer characteristic of vaccine, and the lesion was more intense and the bodies more numerous than with vaccine. Among the changes produced by diphtheria toxin were (1) keratinization of the whole cells or of the whole cell layer, the nuclei staining blue after Borrel's stain; (2) keratinization of cell body alone; (3) keratinization of the perinuclear zone of cytoplasm; (4) separation in globular form of keratin masses which, either in the same or in other cells assumes the perinuclear position and appearance of the vaccine body; (5) transformation of the cell into a cyst containing a great variety of globular, or vacuolated and ring-shaped bodies. Some of these were strikingly geometrical in form and might be described as rosettes. (6) A peculiar series of changes consisted in the formation in the nucleus of one or several large or minute acidophile rings. (7) From the nucleus was sometimes extruded a large strongly acidophile cyst-like body inclosing acidophile granules and minute rings. (8) The peripheral portion of many of the globular bodies broke up into granules which were often regularly arranged in a fringe about a homogeneous central body which was either acidophile or basophile. The fate of all that portion of the nucleus except the nucleolus was a matter of great interest. Careful study of the specimens seemed to demonstrate that the nuclear material apart from the nucleolus did not become incorporated in the fuchsinophile substance but took the form of the basic staining vaccine body. In many nucleoli there appeared a homogeneous basophile substance which sometimes showed convoluted edges, or many regularly placed vacuoles or became broken up into rings. This substance stained brown or blue with Borrel's method, and black after iron-hematoxylin. Very similar vacuolated nuclear bodies were seen in measles. Fuchsinophile intranuclear vacuolated bodies and rings were encountered in diphtherial necroses, and in some foci the changes consisted almost exclusively in the formation of intra- and perinuclear acidophile rings. In variola, especially in the trachea, the multiple nucleoli of the epithelial cells could often be seen to increase in size and to develop several small or large vacuoles, and to appear as congeries of rings. In general it could be said that while diphtheria toxin does not reproduce the corneal lesion of vaccinia it produced definitely many of the typical forms of true vaccine bodies.

In the rabbit's trachea diphtheria toxin produced a great variety of spheroidal or ring-shaped, or vacuolated intracellular bodies, many of which resembled the bodies seen in the human trachea in variola. In the rabbit's bladder, diphtheria toxin produced the usual changes in the epithelial cells, and here many red blood cells had been extravasated into the epithelial layer, fragmented, and lodged between the epithelial cells or about their nuclei. In the mud-puppy (*Necturus*) the inoculation with vaccine in the skin and cornea produced a good deal of keratinization of cells. This formation of homogeneous asidophile material could be seen very definitely in the very large cells of this animal as beginning in the cytoplasm near the nucleus and forming an isolated perinuclear mass resembling a huge vaccine body. Yet the resemblance to the vaccine bodies of the rabbit was extremely distant on account of the large size of the cells. The nucleous and body of the pigmented cell of the skin in necturus frequently became fused into a homogeneous mass and assumed a perinuclear position in other cells. Changes in the nucleoli were not ob-

served in *Necturus*. Inoculation of the skin of the salamander produced much the same lesions as in the frog, but the bodies were much larger and much difficulty was experienced in distinguishing the globules derived from epithelial cells from fragments of red blood cells.

Measles.—In the skin of a case of measles dying in the full eruptive stage of the disease, the epithelial cells in numerous marked foci and diffusely, were found to contain a great variety of intracellular bodies many of which were identical in appearance with the bodies in variola. In certain foci these bodies were much more numerous than he had ever seen in variola. They presented a greater variety of form, and the same variation between acidophile and basophile staining tendency. Keratinization of complete cells and fragmentation of these cells was frequently encountered. Indeed the whole process seemed to be a part of the hyperkeratosis which produced the large flakes thrown off in desquamation in this disease. Among the separate bodies were some which might be described as rings, basophile crescents with acidophile nuclei, vacuolated crescents, pyramidal bodies capping cell nuclei, large basophile or acidophile bodies with vacuoles symmetrically arranged, and many other forms shown in the colored sketch. He could find no satisfactory evidence that these bodies had any other origin than from the epithelial cell bodies and nuclei. After Borrel's stain, the resemblance of these bodies to those produced by diphtheria toxin, or to those seen in variola appeared to be distinct. The acidophile forms seemed traceable to nucleoli and keratinized cell bodies, and the basic bodies, blue and brown, appeared to come from the basophile elements of the nuclei. Nevertheless the resemblance of many of these bodies to developmental forms of a hypothetical protozoon was admittedly great. The occurrence of keratinized cells in the epithelial layer had been described and depicted especially by Bosc in variola and *clavelée* (Cent. f. Bact., Bd. 34, p. 413). This observer correctly stated that whole keratinized cells were readily separated from the "infected" cells in these lesions, but he did not appear to have considered the possibility that these cells might become fragmented and the fragments englobed by healthy cells. Many of the parasitic forms appearing in his sketches were definitely reproduced in the lesions caused by diphtheria toxin.

Anna Foa had recently reported (Archives de Parasitologie T. VII, p. 508) that the bodies produced by diphtheria toxin did not resemble true vaccine bodies which, however, she believed to be degenerative products. No details of this failure to verify Sikowsky's results were given and this part of her extensive study of vaccine bodies did not appear to have been regarded as of much importance.

Summary.—The conclusions drawn from this study were as follows: The inoculation of vaccine and diphtheria toxin in various animals produces a peculiar form of coagulation-necrosis, or keratin necrosis which has been imperfectly recognized and understood, and which results in the formation of homogeneous acidophile material that may be drawn out into fibrils, or broken up into globules, or granules, vacuolated, and englobed by the more healthy epithelial cells in which it appears in the positions occupied by vaccine bodies. This type of necrosis occurs in variola and measles and the bodies produced by it are abundantly present in the epithelial lesions of these diseases. Some of these bodies have been included in the cycles of hypothetical protozoa described by many authors in variola. While forms of a true protozoon may be mixed up with these degenerative products in variola and measles, he was unable to convince himself that any such theory was necessary to account for the suspicious bodies. Some of the suspicious bodies in variola he had been unable to find fully paralleled in diphtherial necroses, especially the presence within the nuclear membrane of several distinct rings of considerable size, and he intended to repeat the systematic comparison of variolous and diphtherial lesions before concluding definitely that no protozoon could be demonstrated in variola and measles. He was strongly of the opinion, however, that the intranuclear rings were vacuolated fragments of nucleolar and nuclear material.

Vaccine Bodies in Monkey's Skin.—Dr. A. W. Williams demonstrated (1) vaccine bodies in monkey's skin (prepared by Dr. Flournoy); (2) smears from vaccine vesicles (Wright's stain.) Dr. Williams said that the specimens shown by her were labeled in detail and it would not be necessary for her to describe them further. She said that since she had had the privilege of examining carefully Dr. Ewing's interesting specimens of rabbit's corneas showing in the epithelial cells changes due to diphtheria toxin, she was more than ever inclined to think that most of the changes seen in the epithelial cells in the lesions of smallpox and vaccinia are due to degeneration and necrosis of the cell contents.

Smears from Vaccine Vesicles.—The two smears, one from vaccine vesicles, and the other, a control from staphylococcus pustules of the rabbit's skin, were brought to show that both have epithelial cells containing similar vaccine-like bodies and that both have a large number of granules in and between the cells. These granules are eosinophile, basophile and a mixture of both. Some of them show beautiful signet ring shapes. The granules have been studied because of the fact that from rabbits vaccine virus filtered through two thicknesses of the finest filter paper has been obtained an almost clear filtrate which was bacteria-free (according to the usual tests) and in which only small granules were seen, but which produced an abundant typical vaccinia when rubbed on freshly shaved rabbit's skin. It has been impossible, however, so far, to discover characteristic granules, though many smears have been examined. Dr. Field kindly assisted in the preparation and examination of these smears. Among various stains used, Wright's modification of Romanowski's stain was chosen for the demonstration of these smears because it had been used recently so successfully by Wright for staining the intracellular protozoon causing Delhi boil.

Trypanosoma Lewisi.—Wright's method was also used for the stained specimen of *Trypanosoma Lewisi* which was demonstrated by Dr. Williams. Dr. Williams thought this *Trypanosoma* might be of interest because it came from one of Novy and MacNeil's test tube cultures, the first pure cultures of a protozoon which have been obtained on artificial culture media. The specimen given to Dr. Park by Dr. Novy about two weeks ago was inoculated into the peritoneal cavity of a while rat; the rat was killed on the eleventh day following, and from its heart-blood were made the two specimens shown, one a hanging drop and the other a dried film. The *Trypanosoma Lewisi* is a flagellate formed frequently in the blood of rats, but seldom causing the death of the animal. This flagellate is also of interest from the fact that it is very similar to the *Trypanosoma Brucii*, the cause of the fatal nagana or tsetse-fly disease of horses in West Africa, and the *Trypanosoma Evansi*, the cause of surra a similar disease met with in India. Since 1901 a number of cases of human infection by an apparently distinct species of *Trypanosoma* have been reported.

Dysentery Bacilli.—Drs. William H. Park and Katherine R. Collins presented a paper on the subject of the dysentery bacilli grouped according to their agglutinins with sera rendered specific by the elimination of the less specific group of agglutinins through absorp-

tion. Dr. Park said his reason for again bringing the subject of agglutination in connection with the dysentery bacilli before the Society was because recent results which they had obtained from the saturation with various bacilli of sera obtained from rabbits previously treated with injections of different strains of dysentery bacilli, seem to be of considerable interest. As is now generally known, the true Shiga dysentery bacilli and those fermenting mannite, although in some sera appearing to agree in their agglutination, yet in others differ almost absolutely. They had previously shown that among the group of the mannite-fermenting varieties there are a number of subgroups, each subgroup containing bacilli obtained from different sources which agree in agglutination characteristics and differ from the bacilli of every other subgroup. The various dysentery bacilli seem especially rich in affinities for such agglutinins as develop through various causes in many adult animals. It is these increased "normal" agglutinins which have caused so much confusion in grouping these bacilli. The blood of a young goat or rabbit which contains no appreciable agglutinin for any of the subgroups becomes, after a single infection with one variety, rich in agglutinin only, for the special bacillus introduced and for others of the same subgroup. Later, after repeated infections the so-called "normal" agglutinins develop, which affect, to a greater or less degree, all varieties of dysentery bacilli. If an animal is injected frequently during a long period of time with a single strain of bacilli, it frequently happens that other distinct varieties of dysentery bacilli are agglutinated in as high dilutions as the variety used for injecting the animals. To prove that such a serum in spite of appearances contained specific agglutinin for the variety inoculated, it was determined to follow the suggestion of Castellani, who separated the common from the specific agglutinins in mixed colon and typhoid infections. It was believed that if the serum from an animal which had been repeatedly injected with one variety of dysentery bacilli was saturated with some other variety the latter might remove all agglutinins for which it had affinity and leave the agglutinins specific for the former. This result was obtained, which permits the hope that in this way a serum truly specific in its agglutination reaction may be obtained for any of the varieties of bacteria comprising large general groups such as those to which the dysentery and colon bacilli belong. The technic was as follows: The surface of the slanted nutrient agar contained in six tubes was inoculated with a single type of dysentery bacilli and the culture allowed to grow for forty-eight hours. The bacilli were then washed off into 90 c.c. of a bouillon culture of twenty-four hours' growth of the same bacillus. To this emulsion was added 10 c.c. of the serum from the immunized rabbit, horse or goat. This 10 per cent. solution of the serum containing enormous quantities of the bacilli was then allowed to stand for twenty-four hours at 37° C. The mixture of serum and bacilli was then filtered through a small Berkefeld filter. The first 50 c.c. of the filtrate was thrown away, as a certain portion of any agglutinins which might be present is retained in the filter from the first portion of the filtrate. If the original serum did not agglutinate higher than 1 to 1,500 the above quantity of bacilli usually exhausted all the agglutinins which had any affinity for the bacilli. The tables showed that the dysentery bacilli used, when tested with exhausted sera, could be divided into three large groups and a number of individual varieties. In rabbit serum before the injections were commenced, there was no appreciable agglutinin for any of the varieties tested. After twelve injections of cultures of a bacillus of the mannite-fermenting type "Class B" agglutinins had developed for "Class B" so that a 1 to 600 dilution of the serum gave a complete agglutination, while for "Class A" of the mannite-fermenting type the agglutination took place in dilutions only up to one part to 200 and for the Shiga type no development of agglutinins occurred. When this "B" serum was saturated with either Shiga of "A" bacilli at least one-half of the aglutinin remained for "Class B" bacilli while all the agglutinin disappeared for the others. In the second experiment given the serum of a horse was used which through injections of both Shiga bacilli and mannite fermenting "Class A" bacilli had developed agglutinins for both these varieties so that dilutions of the serum up to 1-1,500 gave a positive reaction. For all other varieties agglutinins were present to a less extent. These group agglutinins acted in dilutions of about 1-600. Through the absorption of the agglutinins by either of the varieties of bacilli used in injecting the horse all the specific agglutinins for its own class were absorbed together with most of the agglutinins common to most varieties contained in the group of the dysentery bacilli; but the specific agglutinins for the other class largely remained. It will also be noticed that many varieties of bacteria not at all allied to the dysentery bacilli caused more or less absorption of these agglutinins. Others caused almost no absorption. The bacteria which removed agglutinins were all agglutinated in low dilutions by the serum used.

Dr. Ewing said that the examination of Dr. Park's results in the effort to separate the specific agglutinins of very closely related bacterial species, suggested that the absorption method might be employed in the separation of such closely related bloods as human and anthropoid monkey blood by precipitin serum. While he had succeeded with difficulty in identifying higher monkey from human blood by diluted serum, it would seem possible to distinguish more certainly between monkey and human blood or beef, sheep and goat bloods by the use of serum which had been saturated by one of the closely related bloods. After saturation of beef-rabbit serum with sheep blood, only specific precipitin for beef blood ought to remain and none for sheep, but very little would probably be left for either.

Some Observations on the Thread Reaction; its Occurrence in the Human Body.—Dr. E. Libman read a paper with this title. The writer described three forms of specific reactions; the agglutination reaction, the thread reaction; and the so-called "amorphous agglutination reaction." The last having been described by Schmidt during the past year was not discussed by the writer. He said that the subject of the thread reaction was first prominently brought forward by Pfaundler although it had previously been noted by other observers. Pfaundler investigated eight cases of local infection by colon bacilli in each of which he obtained a positive reaction with the serum of the case and the bacillus isolated from the patient in a dilution of at least one to one hundred, if the hanging drop preparations were observed at the end of twenty-four hours. In the febrile cases he obtained a thread reaction, in the other cases a clump reaction. The thread reactions presented the following appearances: The organisms were arranged in long interwoven threads, the latter being generally coiled in skeins. The spaces between the threads were clear and none of the bacilli were motile. Very few individual organisms or single groups of bacilli were found in the thread labyrinths. When observed with high powers the organisms in the threads were of a granular appearance and some were club-shaped. The bacteria could be shown to be alive. In most cases there was more or less agglutination at first. In Pfaundler's experiments he obtained positive reac-

tions only when the patient's blood was tested with the organism causing the infection. He claimed, therefore, that the reaction represented more than a specific reaction; namely, an individualistic one. In some unpublished experiments made by the speaker, in 1898, it was found that the thread reaction was frequently obtained in cases of appendicitis and peritonitis due to the colon bacillus. Only colon bacilli which were closely allied in cultural characters were used. Fever was present in all cases. The general results of the observations were that the thread reactions if they were complete in a dilution of one to twenty seemed to be specific and no interreaction between the various bacilli and a given serum could be demonstrated. The experiments were too few in number, however, to prove distinctly the absence of any interaction and in some cases of proteus infection such interactions were found. In some of the cases agglutination reactions only were present. In a paracolon case described by the speaker two years previous he found that the reaction of the serum with the bacillus always took the form of a thread reaction and that in that case the reaction was distinctly individualistic and assumed a general form resembling chains of streptococci. If agglutination reactions alone had been tested no specific reaction would have been found in this case. The same serum with the same organism no longer gave the thread reaction when transplanted for a number of days on artificial media. This seemed to indicate that the loss of the reaction was due to the change in the bacillus not to a loss of power of the serum. Flexner, Kruse, Duval and Vedder have noted the occurrence of the thread reactions in dysentery and have regarded it as of the same significance as the agglutination reaction. The speaker had found that he could distinguish two forms of thread reaction, one in which the bacilli grew out in long convoluted threads which generally retain their bacillary form. This could be called the end to end reaction and its specific nature is somewhat in doubt. In the other form of thread reaction the organisms assume a coccoid form and the chains resemble those of streptococci. This reaction, in the speaker's experience, when complete was usually specific and individualistic under certain conditions. The reactions are best obtained by making an emulsion in bouillon from a culture of the organism on agar. The suspension must be very dilute, just enough of the culture being used to cause a distinct cloudiness. Sugar bouillon cultures should never be used as in them bacilli of the colon group are apt to take on a coccoid form. In a case of carcinoma of the duodenum with obstruction of the common bile duct the thread reaction was found to occur in the gall-bladder during life. The contents of the bladder was clear fluid, without bile pigment, and contained a small amount of white granular matter. On examining this under the microscope convoluted chains that seemed to be streptococci were found. The sediment decolorized with the Gram stain and the culture made from the fluid gave an organism culturally and morphologically similar to the dysentery bacillus. The serum of the patient gave a chain reaction in a dilution of one to one thousand but no reactions with the colon, typhoid, or paracolon bacilli. The observations made in the case which he had described could not, Dr. Libman believed, be traced to purely accidental influences, nor did he believe they could be due to the icteric condition of the serum, for in the gall-bladder itself the fluid was perfectly clear and not bile stained, and in the second place the serum did not produce such changes in cultures of other closely related bacillary forms. The reaction, Dr. Libman thought, must be regarded as a specific one due to the inflammation of the gall-bladder by the bacillus in question. The observations recorded were of a certain degree of importance because they indicate that great care must be taken in making a diagnosis of streptococci in hanging drops; it must be remembered that one may be dealing with the coccoid forms of bacilli. Dr. Libman had found in a number of instances, in the urine, long chains of what appeared to be streptococci, but on careful examination had been found to be the coccoid forms of the colon bacilli or other bacilli. In these cases it was probable that the acidity of the urine had much to do with the development of the coccoid forms. The difficulty could be avoided, at least to a great extent, by the use of the Gram stain, because up to the present time the thread reaction had been particularly noted with organisms that react negatively to the Gram procedure. In applying the Gram stain on urinary sediments it was important to remember that with very acid urines organisms which are naturally Gram-positive can be very easily decolorized.

MEDICAL AND CHIRURGICAL FACULTY OF MARYLAND.

SECTION ON CLINICAL MEDICINE.

Stated Meeting, held April 1, 1904.

Discussion of Appendicitis.—The meeting was devoted to this topic, Dr. Hemmeter treating the medical side of the question. He first referred to the fact that the truth about appendicitis had been learned largely by American surgeons, and he quoted several very flattering foreign opinions of Reginald Fitz. Many fanciful explanations have been advanced to account for appendicitis, Van Cott suggesting that terminal arteries in the appendix may explain the origin of the disease and others explaining it by supposing nerve degenerations to occur. The simplest though probably not the entire etiology consists in the anatomical features of the organ, for we have here a small gut closed at one end. Many cases of appendicitis are catarrhal throughout, and these get well. The two forms which are not surgical at all are catarrhal appendicitis and appendicular colic, the latter being not an inflammation but a muscular effort to get rid of a foreign body. In these cases fever is not present, the swollen appendix can be palpated and the patients recover under medical treatment. In the ulcerated cases, the cases with abscess or obstruction, the fulminating or peracute cases, and the chronic cases treatment is essentially surgical. The Germans, however, aspirate the abscess cases for diagnostic purposes and the subsequent history of some of these, which did not come to operation, shows that abscess absorption is possible. Curiously enough, at the International Congress in Paris, Tuffier and the other surgeons advised conservative treatment in the early stages, while Potain and the clinicians advised surgical treatment. How should we treat a case of appendicitis medically? First, only that food should be given which is absorbed in the intestine, gives sufficient caloric value and does not reach the appendix. A jelly made with Rhine wine answers these demands, and it is particularly important to warn against the use of milk. Secondly, pain must be controlled, and it is best done by morphine in doses too small to destroy tenderness and in that way mask the symptoms. The advisability of rectal feeding is not altogether proven for antiperistalsis undoubtedly occurs, as can be proven experimentally. Fitz and Sahli advise the use of leeches and it is certain that ice-bags externally are of value.

Differential Diagnosis.—Dr. Winslow discussed this phase of the affection, starting from the thesis that appendicitis is in every case a surgical condition. When a patient previously in good health is taken with ab-

dominal pain—often following some indiscretion of diet—fever, vomiting, diarrhea or constipation, we think naturally of appendicitis and the conditions which simulate it. If the case is one of simple colic, temperature is absent, pulse is low, there is no rigidity, the pain is in the small intestines and is relieved by abdominal pressure. The symptoms in this case, so far from increasing, gradually diminish. In gall-stone colic the pain is higher up, the bladder may be palpable under anesthesia and jaundice is in many cases present. Intestinal perforation is often diagnosed from the symptoms previous to the acute attack, and in case of typhoid fever by the Widal reaction. In females the ovaries and tubes have always to be thought of, and in any case of peritonitis the probability is fairly strong that the appendix was the original source of trouble. Enteroptosis is sometimes a confusing condition. Surgical treatment should be instituted immediately, but Ochsner's method may be of value in the late early and in the early late cases.

Pathology of Appendicitis.—Dr. Hirsch discussed the pathology of appendicitis, referring first to anatomical considerations. The appendix appears about the tenth week of fetal life and is in all probability due to retarded development. It is usually situated behind the cecum pointing toward the spleen and the failure of its artery to run as far as its tip may have clinical importance. The predisposing causes to its inflammation are its structure, its short mesentery and possibly the rheumatic diathesis. The exciting causes are foreign bodies and microorganisms. Pins, worms and concretions having been found in about seven per cent. of 14,000 cases analyzed by Mitchell. The colon bacillus, the pyogenic cocci, tubercle bacillus and the actinomyces are the organisms most often found. Pathologically there is only one form of appendicitis, the acute infective type, but the cystic, the parietal, the gangrenous and the perforative form may be distinguished clinically.

Immediate Surgical Intervention.—Dr. Blake favored this mode of procedure when the diagnosis was made, but the difficulty of the diagnosis was illustrated by a case of his who died of multiple liver abscess following appendicitis, her case having been thought to be typhoid fever, tuberculous peritonitis or actinomycosis of the liver.

Dr. Atkinson referred to the value of the leucocyte count in making the diagnosis early, though he admitted that in many cases it was of no help whatever. He also referred to the confusion in diagnosis which may be caused by perinephric abscess and by retroperitoneal glands.

Dr. Watson said that in his experience as a general practitioner he had found it wise to refer cases of appendicitis to a surgeon immediately, and his general rule was always to send his cases when there was increase of any symptom, whether pulse or pain or what not. He had never had any cases operated on too early, but he had several operated on too late. One patient of his was seen in the evening with suspicious but not marked symptoms. He decided to watch the case till morning. She passed an exceedingly good night, sleeping naturally and without pain and was quite comfortable next morning. Her pulse, however, had risen slightly and on that indication she was referred to the surgeons who found an appendix in very bad condition.

LOVING CUP FOR DR. W. T. BULL.—Dr. William T. Bull severed his connection with the College of Physicians and Surgeons Wednesday, and as a sign of their regard the classes of 1904 and 1905 presented to him a silver loving cup, suitably engraved.

BOOK REVIEWS.

THE INTERNATIONAL MEDICAL ANNUAL. A Year-book of Treatment and Practitioner's Index. 1904. Twenty-second Year. E. B. Treat & Co., New York.

THE International Medical Annual is always an excellent review of the past year's medical literature. Its contributors are mainly distinguished English medical men and it is well known how conscientiously they do their work. One of the features of the present year is the introduction of stereoscopic views of pathological specimens. These give an excellent idea of the shape and form of specimens and of the localization of lesions. A little instrument is provided for the examination of the views and there is no doubt that it adds greatly to the solution of the difficult problem of the illustration of pathological conditions. There are some excellent plates in illustration of typical stages of certain of the exanthemata.

As is usually the case, the volume is largely devoted to treatment. Among the reviews of recent literature that seem especially practical are those of diabetes and of drug poisoning. The subject of anesthesia, too, has a very full review, and the recent literature of kidney affections has received the notice that its extensive list deserves.

INFANT FEEDING IN ITS RELATION TO HEALTH AND DISEASE. By LOUIS FISCHER, M.D., Visiting Physician to the Willard Parker and Riverside Hospitals, New York City, etc. Containing 54 Illustrations with 24 Charts and Tables, mostly Original. Third Edition. F. A. Davis Company, Philadelphia.

THIS excellent book seemed perfect before and yet the author has found means of improving it. In this new edition very considerable changes have been made, some of the old matter being omitted and several new chapters added.

One of the most timely of the additions is a chapter on "Buttermilk Feeding," which has lately been attracting much attention abroad. The food is prepared by adding flour and sugar and boiling; it has many advantages over other forms of artificial food owing largely to the strong bactericidal powers possessed by buttermilk. Another valuable addition is the chapter "Milk Idiosyncrasies in Children," in which the trying cases of children who will not tolerate milk are discussed. A chapter on feeding children with cleft palate has also been added.

The problem of adapting artificial foods to the individual needs of infants is becoming so vital that no practitioner can afford to neglect this rather difficult branch of treatment. Every one, experienced or tyro, will derive the greatest assistance from this book, which is surpassed by none in practicality, convenience of reference and authoritativeness.

BOOKS RECEIVED.

The MEDICAL NEWS *acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the* MEDICAL NEWS *will shortly appear.*

LA RHINOPLASTIE. By Drs. C. H. Nelaton and Ombredanne. 8vo, 438 pages. Illustrated. G. Steinheil, Paris.

DISEASES OF THE INTESTINES. By Dr. M. Einhorn. Second edition. 397 pages. Illustrated. Wm. Wood & Co., New York.

COMMONER DISEASES OF THE EYE. By Drs. C. A. Wood and T. A. Woodruff. 8vo, 500 pages. G. P. Englehard & Co., Chicago.